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TRAVELS

IN THE

INTERIOR OF BRAZIL,

PRINCIPALLY

THROUGH THE NORTHERN PROVINCES,

AND

THE GOLD AND DIAMOND DISTRICTS,

DURING THE YEARS 1836—1841.

85755

BY

GEORGE GARDNER, F.L.S.,

SUPERINTENDENT OF THE ROYAL BOTANIC GARDENS OF CEYLON.

3.d.10

"A populous solitude of bees and birds,
And fairy-formed and many-colour'd things,
* * * * * the gush of springs,
And fall of lofty fountains, and the bend
Of stirring branches, and the bud which brings
The swiftest thought of beauty, here extend,
Mingling, and made by Love, unto one mighty end."

CHILDE HAROLD.

LONDON:

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1846.

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REEVE, BROTHERS,
PRINTERS AND LITHOGRAPHERS OF SCIENTIFIC WORKS,
KING WILLIAM STREET, STRAND.

TO

SIR WILLIAM JACKSON HOOKER,

K.H., D.C.L., LL.D., F.R.A., AND L.S.,

VICE-PRESIDENT OF THE LINNEAN SOCIETY; HONORARY MEMBER OF THE ROYAL IRISH ACADEMY;

MEMBER OF THE IMPERIAL ACADEMY CÆSAR. LEOPOLD. NATURAL CURIOSORUM, ETC., ETC.,

AND

Director of the Royal Gardens of Kew,

TO WHOM THE SCIENCE OF BOTANY IS SO MUCH INDEBTED, ALIKE FOR HIS

LIBERAL PATRONAGE, AND THE CONTRIBUTIONS MADE TO IT

IN THE NUMEROUS AND VALUABLE WORKS WHICH HAVE ISSUED FROM HIS PEN,

THE FOLLOWING WORK,

CONTAINING THE NARRATIVE OF TRAVELS,

WHICH, BUT FOR HIS KINDNESS AND ENCOURAGEMENT,

COULD NEVER HAVE BEEN UNDERTAKEN,

IS INSCRIBED,

WITH FEELINGS OF PROFOUND RESPECT AND ESTEEM,

BY HIS GRATEFUL FRIEND AND PUPIL,

GEORGE GARDNER.

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PREFACE.

THE present volume is not given to the public, because the author supposes it presents a better account of certain parts of the immense Empire of Brazil, than is to be found in the works of other travellers, but because it contains a description of a large portion of that interesting country, of which no account has yet been presented to the world. It has been his object to give as faithful a picture as possible of the physical aspect and natural productions of the country, together with cursory remarks on the character, habits, and condition of the different races, whether indigenous or otherwise, of which the population of those parts he visited is now composed. It is seldom that he has trusted to information received from others on those points; and he hopes that this fact will be considered a sufficient reason for his not entering into desultory details more frequently than he has done.

Ample opportunities were offered for studying the objects he had in view, of which he never ceased to avail himself. Besides visiting many places along the coast, his journeys in the interior were numerous; and, although he never ventured, like Waterton—whose veracity is not to be doubted—to ride on the bare back of an alligator, or engage in single combat with a Boa Constrictor, yet he had his full share of adventure, particularly during his last journey, which extended, north to south, from near the equator to the twenty-third degree of south latitude; and east to west, from the coast to the tributaries of the Amazon. The privations which the traveller experiences in these uninhabited, and often desert countries, can scarcely be appreciated by those who have never ventured into them, where he is exposed at times to a burning sun, at others to torrents of rain, such as are only to be witnessed within the tropics, separated for years from all civilized society, sleeping for months together in the open air, in all seasons, surrounded by beasts of prey and hordes of more savage Indians, often obliged to carry a supply of water on horseback over the desert tracts, and not unfrequently passing two or three days without tasting solid food, not even a monkey coming in the way to satisfy the cravings

of hunger. Notwithstanding these, however, and one serious attack of illness, his enthusiasm carried him through all difficulties, and they have in some measure been repaid by the pleasure which such wanderings always afford to the lover of nature, and by the number of new species which he has been enabled to add to the already long list of organized beings.

The author has only further to add, that the notes from which the narrative has been drawn up, were, for the most part, written during those hours, which, under other circumstances, should have been devoted to sleep; and that the narrative itself was principally compiled from them, during a voyage from England to the Island of Ceylon.

Kandy, Ceylon, January 1st, 1846.

The manuscript of Mr. Gardner's 'Travels in Brazil' having been transmitted from Ceylon, and printed during his official residence in that island, the Publishers feel desirous of expressing the great obligation they are under to John Miers, Esq., in the absence of the author, for his valuable assistance in correcting the technical, botanical, and Brazilian proper names, whilst passing through the press; they also desire to record their sense of the kind services rendered by Robert Heward, Esq., co-operating with Mr. Miers in reading the proofs.

London, October 1st, 1846.

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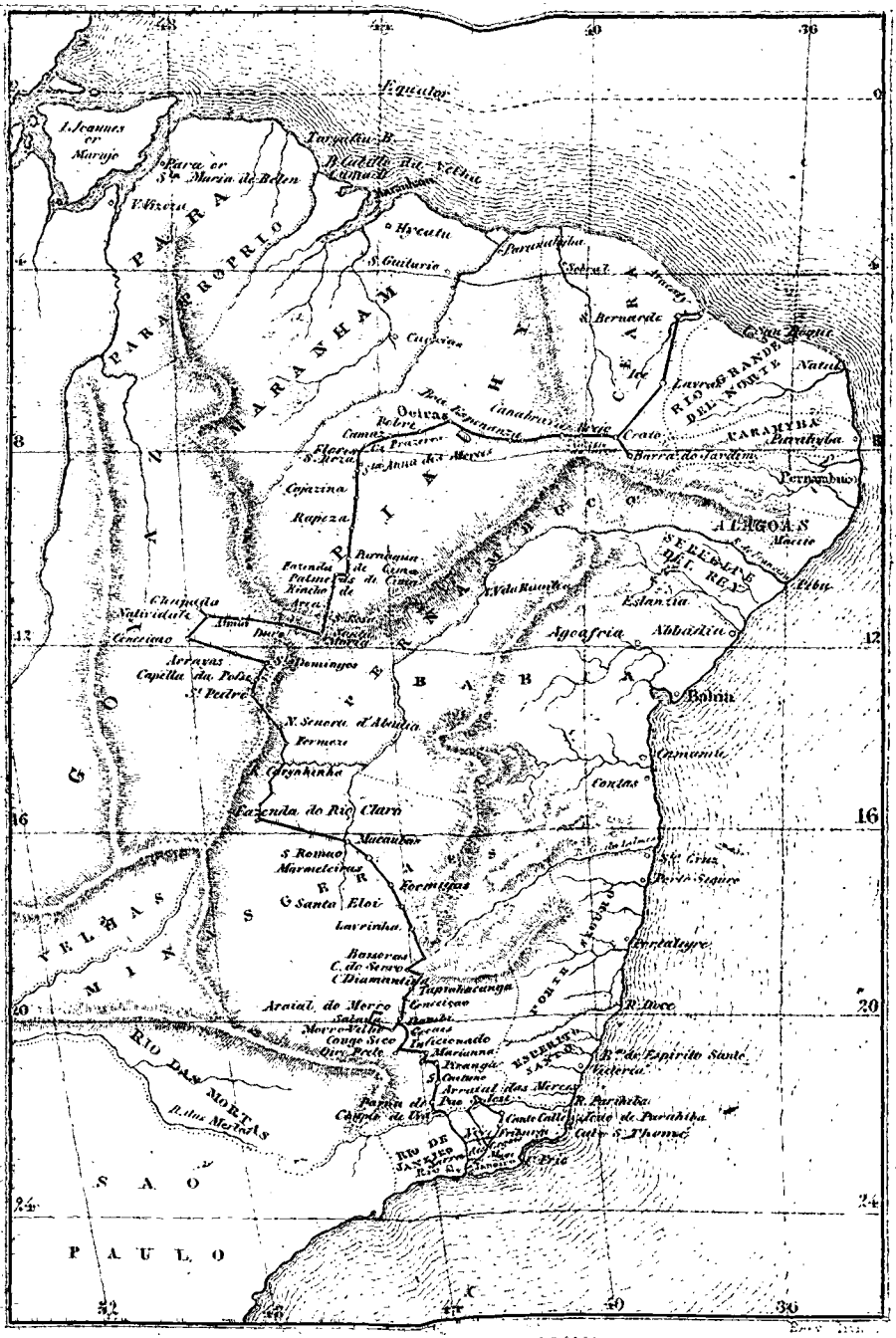


MAP OF BRAZIL

TRAVELS

IN THE

INTERIOR OF BRAZIL.

CHAPTER I.

RIO DE JANEIRO.

Motives for visiting Brazil—Voyage from England—Arrival at Rio de Janeiro—Description of the City—Its Environs—Geological Character of its Neighbourhood—Its Climate—Its Inhabitants—State of Slavery in Brazil—General good treatment of Slaves—Different Mixed Races—Excursion to the Mountains surrounding the Capital—Its Botanical Garden—Museum of Natural History.

HAVING devoted much of my leisure time, during the course of a medical education, to the study of Natural History generally, but more particularly to Botany; and my mind being excited by the glowing descriptions, which Humboldt and other travellers have given of the beauty and variety of the natural productions of tropical countries, the magnificence of their mountain scenery, and the splendour of their skies, an ardent desire seized me to travel in such regions.

My early patron and teacher in Botany, Sir William J. Hooker, then professor of that science in the University of Glasgow, aware of my wishes, strongly recommended a voyage to some part of South America; and Brazil was fixed on as the best field for my researches, as the vegetable productions of that immense empire were then less known to the English botanist than those perhaps of any other country of equal size in the world. It was true that it had been visited both by German and French Naturalists, but no Englishmen, with the exception of Cunningham and Bowie, and the intrepid Burchell, had penetrated into the interior; whole provinces, particularly in the north, still lay open as virgin fields for the investigations of some future traveller; and these I was desirous to explore.

The preparations necessary for such an undertaking having been completed, I left Glasgow on the 14th of May, 1836, and on the 20th of the same month embarked at Liverpool, on board the Barque 'Memnon,' bound for Rio de Janeiro, the capital of Brazil. The voyage across the Atlantic to South America has been too often described for me to say more than that we had a fair share of calms and squalls, of bright skies and brilliant sun-sets, of sharks and whales, flying fishes, and phosphorescent waves. A tedious, but not unpleasant voyage, brought us in sight of land on the 22nd of July. When day broke, Cape Frio, as had been predicted by the captain, was seen, bearing N.N.E., about twenty-five miles distant. This Cape is about seventy miles to the eastward of Rio de Janeiro, and a range of high undulating hills stretch between them, covered to their topmost ridge with trees. On their summits, numerous Palms with their slender shafts

surmounted by a ball-like mass of leaves, rising far above the other denizens of the forest, and standing boldly out in relief against a beautiful blue sky, give a marked character to the scene, and silently proclaim to the European his approach to a world the vegetation of which is very different from that of the one he has so recently left. The winds were light all day, and as we sailed close along the coast, my eye, through the medium of the ship's telescope, was constantly surveying the wild but beautiful scene, and in imagination I was already revelling amid its multiform natural productions.

It was long past noon before we reached the entrance to the Bay of Rio, which is very remarkable for the number of conical hills and islands which are to be seen on both sides of it. One of these hills is the well-known Pão d'Açucar, so called from its resemblance to a sugar-loaf. It is a solid mass of granite, rising to the height of about one thousand feet, and destitute of vegetation, with the exception of a few stunted shrubs on its eastern declivity. Seen from a great distance at sea, it is an admirable land-mark for ships making the port. Passing through the magnificent portal, we came to an anchor a few miles below the city, not being allowed to proceed further till we were visited by the authorities. It is quite impossible to express the feelings which arise in the mind while the eye surveys the beautifully varied scenery which is disclosed on entering the harbour—scenery which is perhaps unequalled on the face of the earth, and on the production of which nature seems to have exerted all her energies. Since then I have visited many places celebrated for their beauty and their grandeur, but none of them

have left a like impression upon my mind. As far up the Bay as the eye could reach, lovely little verdant and palm-clad islands were to be seen rising out of its dark bosom, while the hills and lofty mountains which surround it on all sides, gilded by the rays of the setting sun, formed a befitting frame for such a picture. At night the lights of the city had a fine effect; and when the land-breeze began to blow, the rich odour of the orange and other perfumed flowers, was borne sea-ward along with it, and, by me, at least, enjoyed the more from having been so long shut out from the companionship of flowers. Ceylon has been celebrated by voyagers for its spicy odours, but I have twice made its shores with a land breeze blowing, without experiencing any half so sweet as those which greeted my arrival at Rio.

On the following morning, the 23rd of July, I first put foot on the shores of the great continent of the new world. If the aspect of the country, and the nature of the vegetation were so different from those of the old country, how much more strange were the human beings which first met my sight on landing. The numerous small boats and canoes which ply about in the harbour, are all manned with African blacks; the long narrow streets through which we passed were crowded with the same race, nearly naked, many of them sweating under their loads, and smelling so strongly as to be almost intolerable. Scarcely a white face was to be seen. The shops, in the most of which both the doors and windows are thrown open during the day, seemed to be attended to by Mulattos, or by Portuguese of nearly as dark a hue. Seen from the ship in the morning the city had a

most imposing appearance, from its position, and the number of its white-washed churches and houses; but nearer contact with it dispelled the illusion. The streets are narrow and dirty, and what with the stench from the thousands of negroes which throng them, and the effluvia from the numerous provision shops, the first impressions are anything but agreeable. I could not help recalling to mind the lines, in 'Childe Harold,' which Byron has applied to the capital of the mother country:—

> "But whoso entereth within this town,
> That, sheening far, celestial seems to be,
> Disconsolate will wander up and down,
> 'Mid many things unsightly to strange ee;
> For hut and palace show like filthily:
> The dingy citizens are reared in dirt.—"

The city of Rio occupies part of an irregular triangular tongue of land, which is situated on the west side of the Bay, about three miles northward from the entrance. The ground on which it stands is, for the most part, level, but towards the north, the west, and the south-east, it is bounded by a series of hills. The long narrow streets run at right angles to each other, by which the houses are thrown into great square masses. The new town stretches out in a north-west direction, and is separated from the old one by a large square called the Campo de Santa Anna. Beyond it a narrow branch of the Bay runs inland, to the left of which is the extensive suburb of Catumbi, and farther on those of Mataporco and Engenho Velho. Besides the Campo de Santa Anna there are two other large squares, one before the theatre, and another at the landing place, in which is situated the

palace formerly occupied by the Viceroys. The Royal Palace of S. Cristovão, the residence of the Emperor, is a great and irregular mass of building, situated a little way beyond the new town.

Not only are the streets narrow and dirty, but they are also badly lighted and worse paved, notwithstanding the city is immediately surrounded by mountains of the most beautiful granite. The houses are very substantially built, for the most part of granite, consisting principally of only two or three stories. It contains several fine churches, but few of them are so situated as to be seen to advantage. That of Nossa Senhora da Gloria is one of the most conspicuous, being placed on a rounded hill of the same name, that juts into the sea between the city and the Praia de Flamengo. Besides the churches there are many other public buildings, among which may be mentioned the Monastery of Sãn Bento, near the harbour, the Convent of Santa Thereza on the brow of a hill beside the noble aqueduct by which the water for the supply of the city is conveyed from the mountains, a Mint, an Opera House, a Theatre, a public Library, which is said to contain about one hundred thousand volumes, a Museum of Natural History, a Medical School, two Hospitals, and, what the inhabitants boast very much of, the Camara dos Senadores, which is equivalent to our House of Lords. It is a very handsome building, which was erected a few years ago on the north side of the Campo de Santa Anna. Scattered through the city there are some fine fountains, to which water is conveyed by an aqueduct. One of them is in the palace square, for the supply of the ships in the harbour. The aqueduct

itself is upwards of six miles in length, and is terminated city-wards by a magnificent row of double arches.

From an eminence within the city, called the Castle Hill, a fine view both of the city and bay is obtained. It also commands a delightful prospect of the country on the opposite side of the bay, with the city of Nitherohy, or Praia Grande, in the foreground, and the lofty Organ mountains towering in the distance to the left. There are many parts of the country in the immediate neighbourhood of Rio, which remind a Scotchman of some of the highland scenery of his native country, but with this difference, that, whilst there the mountains are bleak and barren, here they are covered to their summits with a luxuriant tropical vegetation.

The great desire of the inhabitants seems to be to give an European air to the city. This has already been accomplished to a great extent, partly from the influx of Europeans themselves, and partly by those Brazilians who have visited Europe either for their education or otherwise. It is but seldom now that those extraordinary dresses, both of ladies and gentlemen, which we see represented in the publications of those travellers who visited Rio even in the early part of the present century, are to be seen in the streets. A few old women only, and those mostly coloured, are observed wearing the comb and mantilla; and the cocked hat and gold buckles are also all but extinct. Now, both ladies and gentlemen dress in the height of Parisian fashion, and both are exceedingly fond of wearing jewellery. One of the finest streets in the city is the Rua d'Ouvidor, not because it is broader, cleaner, or better paved than the others, but

because the shops in it are principally occupied by French milliners, jewellers, tailors, booksellers, confectioners, shoe-makers, and barbers. These shops are fitted up with an elegance which the stranger is quite unprepared to meet. Many of them are furnished with windows formed of large panes of plate glass, similar to those which are now so common in every large town in Great Britain. Indeed, it is the Regent Street of Rio, and in it almost any European luxury can be obtained.

A few years ago omnibusses were started to run from the city to the different suburbs. Small steamers ply regularly between Rio and the city of Nitherohy on the opposite side of the bay, and one runs daily to Piedade at the head of it. There is a yearly exhibition of the fine arts, in which are exposed many tolerable pictures both by native and foreign artists. Music is very much cultivated, and the piano, which, at the time when Spix and Martius visited Rio, in 1817, was only to be met with in the richest houses, has now become almost universal. The guitar was formerly the favourite instrument, as it still is all over the interior. There are excellent schools for the education of boys; and boarding schools have been established for young ladies, which are conducted on the same principles as those of a similar nature in England. Being the capital of the empire, and there being residents at the court from most of the European nations, Rio is the scene of much greater gaiety than is generally supposed by those who have never visited it. But as all these matters have been more learnedly "discoursed of," than I profess to be able to do, I shall pass over in silence the levees, the opera, the theatres, whether

French or Portuguese, and the balls, public as well as private, which engross quite as much of the attention of the fashionable world here as elsewhere.

Of the many European merchants established here, who for the most part are English, few reside in the city, most of them having country houses in the suburbs. One of the most fashionable resorts is a lovely spot about two miles out, called Botafogo. There the houses are built along the semicircular shore of a quiet bay, which is nearly surrounded by high hills. Immediately behind the houses, and almost overhanging them, stands a very remarkable mountain called the Corcovado, which rises to upwards of two thousand feet above the level of the sea, about two thirds of its eastern face being a perpendicular precipice. Many other European residences are situated in Catete and on the Praia de Flamengo, between Botafogo and the city; and in the Laranjeiras valley, which stretches up from Catete towards the mountains; others exist at the opposite extremity of the city, in the district of Engenho Velho.

There is one thing wanting in the neighbourhood of Rio which no large city should be without—a public drive. This, I find in India, is a point particularly attended to, whenever, even a few, Europeans are located together. At Rio those who wish to take a morning or an evening drive, can only do so on the public roads, which are only fit for carriages to run on for a few miles out of the city. There is, indeed, quite close to it what is called the Passeio Publico, a large garden with shady walks, but it is only intended for those who walk. Of an evening, when the weather is fine, it is much frequented

by the citizens. The Botanic Garden, which is about eight miles distant from the city, is a place of great resort.

On landing I took up my residence at an Italian hotel, in one of the principal streets, but as this was not a place fitted to my pursuits, as soon as all my luggage was landed, I removed to the boarding house of an old English lady, who had then been about thirty years in the country. It was about three or four miles from the city, situated in a beautiful valley which stretches from the suburb of Engenho Velho towards the Corcovado mountain, and called Rio Comprido, from a small stream so named which runs through it. Here I had my head-quarters for about five months, and during that period my excursions extended in all directions round the city. Frequent visits were made to the mountains, which are all covered with dense virgin forests—to the humid valleys—to the swampy tracts which lie to the north of the city—to the sea shores—and to the islands in the bay. From these rambles there resulted a rich botanical harvest, besides numerous specimens belonging to other branches of natural history. But as an eternal spring and summer reign in this happy climate, and as almost every plant has its own season for the production of its flowers, every month is characterized by a different Flora. It is, then, scarcely to be expected that a residence of but a few months can afford more than a very partial knowledge of its vegetable riches.

The whole of the country around Rio is essentially granitic, all the rocks being of that nature to which the name of Gneiss-granite has been applied, from their pos-

sessing decided marks of stratification. The mountains generally run in chains having no particular direction, and are of all sizes, from slight eminences to mountains which rise from 2000 to 3000 feet above the level of the sea. The loftier of these mountains, such as the Peak of Tejuca, the Corcovado, and the Gavea, have their south-east sides bare and precipitous, while those to the northward have a gradual ascent, and are wooded to their summit. Notwithstanding the enormous length of time which the sides of these mountains have been covered with their mighty forests, the alluvial layer of soil which rests on them is very thin. This, however, may be accounted for by the heavy rains washing it, as well as the materials from which it is formed, down into the vallies, where the alluvium is often found to be many feet deep. Hence it is that the deep vallies which intersect the mountain ranges are the principal seats of agricultural industry; and some of them, particularly in the vicinity of the city, are thickly studded with habitations, surrounded with plantations of Coffee, Oranges, Bananas, and Mandioca. Many of the lower hills near the city are now also cleared and planted with Coffee, but the plantations were too young when I left to form any idea of their success at so low a level, Beneath the alluvium there is a bed of reddish-coloured clay, which is very tenacious when wet. It is often from thirty to forty feet in thickness, and is not peculiar to the province, as I have met with it in every part of Brazil where I have travelled. It frequently contains numerous boulders, consisting of rounded, as well as angular fragments of Gneiss, Granite, and Quartz, and is often inter-stratified with various beds of sand and

gravel. It is obvious then from these observations, that the soil around Rio itself is not generally rich. Indeed, the first thing which strikes a stranger on his arrival, is the apparent poverty of the soil contrasted with the richness of the vegetation. But for the humidity of the atmosphere, the heavy dews of the dry season, and the rains of the wet, combined with the heat of a tropical sun, the greater part of the country immediately surrounding Rio would not be worthy of cultivation. The very small quantity of soil which suffices for some plants is quite astonishing to a European. Rocks, on which scarcely a trace of earth is to be observed, are covered with *Vellozias*, *Tillandsias*, *Melastomaceæ*, *Cacti*, *Orchideæ*, and *Ferns*, and all in the vigour of life.

The climate of Rio has been very much modified by the clearing away of the forests in the neighbourhood. Previous to this the seasons could scarcely be divided into wet and dry as they are at present. Then rains fell nearly all the year round, and thunder-storms were not only more frequent, but more violent. So much has the moisture been reduced, that the supply of water for the city has been considerably diminished, and the government has, in consequence, forbidden the further destruction of the forests on the Corcovado range, towards the sources of the aqueduct. During the months of May, June, July, August, and September, the climate is usually delightful, being the dry as well as the cool season. The mean temperature of the year is 72°. Although frequent showers fall during the dry season, yet they are not to be compared with the continued rains of the other, which generally commence in October. The rainy season sets

in with heavy thunder-storms, which are of most frequent occurrence in the afternoon.

The population of Rio consists principally of Portuguese and their descendants, both white and coloured; those only born in the country are styled Brazilians; and ever since its independence as an empire in 1820, a very bad feeling has existed between them and those who are natives Portugal. But this feeling is less common among the higher than the lower orders, and is, perhaps, more strongly marked in the inner provinces than on the coast. Wherever any riot, or any attempt at revolt takes place in the interior—and such occurrences are now, unfortunately, but too common—the poor Portuguese are the first to fall victims, being butchered without mercy, and robbed of all they possess. Notwithstanding the ill usage they receive, hundreds of them arrive yearly to push their fortune in the country, which, at one time, formed the richest gem in the crown of Portugal. Many of those who call themselves white in Brazil, scarcely deserve the title, as few of those families who have been long in the country, have preserved the purity of the original stock. The inhabitants of Rio are in general short, and slightly made, and form a great contrast to the tall and handsome inhabitants of the Provinces of San Paulo and Minas Geräes, and even those of several of the northern provinces. The Brazilian wherever he is met with is always polite, and but very seldom inhospitable, especially in the less frequented parts of the country. He is much more temperate in his drinking than in his eating, and much addicted to snuff-taking as well as to smoking: hence the prevalence of dyspeptic

and nervous complaints among them. Marriage is less common in Brazil than in Europe, a fact which accounts for the greater laxity of morals which exists here among both sexes. The women are generally short, and when young are pretty and agreeable, but as they increase in years they mostly get very corpulent, from their living well and taking but little exercise. In Rio and the other large towns, they always make their appearance when strangers call, but such is not the case in most parts of the interior; there they still remain shy, but with an abundance of curiosity. I have lived for a week at a time in houses where I was well aware there were ladies, without ever seeing more of them than their dark eyes peering through chinks about the doors of the inner apartments. In the distant province of Goyaz, Matto-Grosso, and Piauhy, nearly all classes of them are as much addicted to the use of the pipe as the men. It is but very seldom that native Indians are to be seen in Rio; I was several months in the country before I saw one. The brown boatmen, in the harbour, who have been taken for Indians, are, as Spix and Martius have already observed, Mulattoes of various shades of colour.

Much has been written on slavery as it exists in Brazil. It is a subject of great importance, and demands a much greater amount of observation than has generally occurred to those who have written on it at greatest length. Those have mostly been voyagers, *en passant*, who have derived their knowledge from others, and not from personal observation. The most ridiculous stories are told by the European residents to strangers on their arrival, as I well know from personal experience. One of the more recent

works on Brazil, which on its appearance was the most accredited in Europe, is, perhaps, the least to be depended on. I have good authority for stating that the author noted down every statement that was made to him, however extraordinary, without the slightest examination as to its truth. More than one individual has informed me, that, at dinner parties, they have heard persons present, who were more famed for their wit than their veracity, cramming him with information about Brazil, which, in truth, was worse than no information at all; but everything seemed to be acceptable, and was immediately entered in his note-book.

In the year 1825, Humboldt estimated the entire population of Brazil at about 4,000,000; of this number he calculated that 920,000 were whites, 1,960,000 negroes, and 1,120,000 mixed races and native Indians. Here the proportion of the coloured races to the whites is about three to one. Later estimates give an entire population of 5,000,000; and the proportion of the coloured race to the whites stands as four to one. It was supposed at the time when the law was passed to render illegal the introduction of new slaves, that the proportional number would speedily decline. Had this law been strictly observed such would, no doubt, have been the case, as it is well known that the number of births fall far short of the deaths among the slave population in Brazil. This does not arise from their ill usage, as some writers have supposed, but from the well-known fact that a greater proportion of males than of females have at all times been introduced to the country. On some estates in the interior the proportion of females to males is often as low as

one to ten. In the Diamond District, in particular, females are very scarce. The law, however, has not been attended to, and the consequence of incessant introduction is, that the number of slaves in the country has not declined. During the five years which I spent in Brazil, I have good reason for believing that the supply was always nearly equal to the demand, even in the most distant parts of the empire. Notwithstanding the vigilance of the cruisers both on the coast of Brazil and that of Africa, it was well known to every one in Rio, that cargoes of slaves were regularly landed even within a few miles of the city; and during several voyages which I have made in canoes and other small craft along the shores of the northern provinces, I have repeatedly seen cargoes of from one to three hundred slaves landed, and have heard of others. There are many favourite landing places between Bahia and Pernambuco, particularly near the mouth of the Rio San Francisco. Again and again, while travelling in the interior, I have seen troops of new slaves of both sexes, who could not speak a single word of Portuguese, varying from twenty to one hundred individuals, marched inland for sale, or already belonging to proprietors of plantations. These bands are always under the escort of armed men, and those who have already been bought, are not unfrequently made to carry a small load, usually of agricultural implements. There is no secrecy made of their movements, nay, magistrates themselves are very often the purchasers of them. It is likewise well known that the magistrates of those districts where slaves are landed, receive a certain per centage on them as a bribe to secrecy. The high price which they bring in the market,

is a very great temptation to incur the risk of importing them. It is said that if only one cargo be saved out of three, that one will cover the whole expences, and leave a handsome profit besides.

Previous to my arrival in Brazil, I had been led to believe, from the reports that have been published in England, that the condition of the slave in that country was the most wretched that could be conceived; and the accounts which I heard when I landed—from individuals whom I now find to have been little informed on the point—tended to confirm that belief. A few years residence in the country, during which I saw more than has fallen to the lot of most Europeans, has led me to alter very materially those early impressions. I am no advocate for the continuance of slavery; on the contrary, I should rejoice to see it swept from off the face of the earth—but I will never listen to those who represent the Brazilian slave-holder to be a cruel monster. My experience among them has been very great, and but very few wanton acts of cruelty have come under my own observation. The very temperament of the Brazilian is adverse to its general occurrence. They are of a slow and indolent habit, which causes much to be overlooked in a slave, that, by people of a more active and ardent disposition, would be severely punished. Europeans, who have this latter peculiarity more strongly inherent in them, are known to be not only the hardest of taskmasters, but the most severe punishers of the faults of their slaves.

In Brazil, as in all other countries, there is more crime in large towns than in the agricultural districts. This arises from the greater facilities which exist in the former

for obtaining ardent spirits; yet, among the black population, intoxication is not often observed, even dense as it is in Rio de Janeiro. It was on a Sunday morning that I arrived in Liverpool from Brazil, and during the course of that day I saw in the streets a greater number of cases of intoxication, than, I believe, I observed altogether among Brazilians, whether black or white, during the whole period of my residence in the country. In the large towns the necessity for punishment is of frequent occurrence. The master has it in his own power to chastise his slaves at his own discretion. Some, however, prefer sending the culprit to the Calabouça, where, on the payment of a small sum, punishment is given by the police. Many of the crimes for which only a few lashes are awarded, are of such a nature that in England would bring upon the perpetrator either death or transportation. It is only for very serious crimes that a slave is given up entirely to the public tribunals, as then his services are lost to the owner, either altogether, or at least for a long period.

On most of the plantations the slaves are well attended to, and appear to be very happy. Indeed, it is a characteristic of the negro, resulting no doubt from his careless disposition, that he very soon gets reconciled to his condition. I have conversed with slaves in all parts of the country, and have met with but very few who expressed any regret at having been taken from their own country, or a desire to return to it. On some of the large estates at which I have resided for short periods, the number of slaves often amounted to three or four hundred, and but for my previous knowledge of their being such, I could

never have found out from my own observations that they were slaves. I saw a set of contented and well-conditioned labourers turning out from their little huts, often surrounded by a small garden, and proceeding to their respective daily occupations, from which they returned in the evening, but not broken and bent down with the severity of their tasks. The condition of the domestic slave is, perhaps, even better than that of the others; his labour is but light, and he is certainly better fed and clothed. I have almost universally found the Brazilian ladies kind both to their male and female domestic slaves; this is particularly the case when the latter have acted as nurses. On estates, where there has been no medical attendant, I have often found the lady of the proprietor attending to the sick in the hospital herself.

Slaves, however, are variously inclined; from the very nature of a negro—his well-ascertained deficient intellectual capacity—the want of all education—the knowledge of his position in society, and the almost certainty of his never being able to raise himself above it—we need not wonder that there should be among them some who are restless, impatient of all control, and addicted to every vice. It is the frequent necessity which arises for the punishment of the evil-disposed that has led to the supposition of the indiscriminate and universal use of the lash. If the intellectual capacity of the negro be contrasted with the native Indian, it will not be difficult, on most points, to decide in favour of the latter. It is no small proof of the deficient mental endowment of the negro, that, even in remote parts of the empire, three or four white men

can keep as many as two or three hundred of them in the most perfect state of submission. With the Indian this could never be accomplished, for they too once were allowed to be held as slaves, and even still are, on the northern and western frontier, although contrary to law. The Indian has the animal propensities less fully developed than the negro; hence he is more gentle in his disposition, but, at the same time, is much more impatient of restraint.

The character and capacity of the negro vary very much in the different nations. Those from the northern parts of Africa are by far the finest races. The slaves of Bahia are more difficult to manage than those of any other part of Brazil, and more frequent attempts at revolt have taken place there than elsewhere. The cause of this is obvious. Nearly the whole of the slave population of that place is from the Gold coast. Both the men and the women are not only taller and more handsomely formed than those from Mozambique, Benguela, and the other parts of Africa, but have a much greater share of mental energy, arising, perhaps, from their near relationship to the Moor and the Arab. Among them there are many who both read and write Arabic. They are more united among themselves than the other nations, and hence are less liable to have their secrets divulged when they aim at a revolt.

To sum up these observations, I have had ample opportunity, since I left South America, for contrasting the condition of the slave of that country, with that of the Coolie in the Mauritius and in India, but more particularly in Ceylon; and were I asked to which I would give the

preference, I should certainly decide in favour of the former, although, at the same time, I could not but exclaim with Sterne, "still, Slavery! still thou art a bitter draught!"

A general rise of the black population is much dreaded in Brazil, which is not unreasonable, when the great proportion it bears to the white is taken into consideration. Were they all united by one common sympathy, this would have happened long ago, but the hostile prejudices existing among the different races of Africans, have hitherto prevented it. In the northern and interior provinces, considerable encouragement to their insubordination has been offered, by the general feeling that animates a large proportion of the free class, who are mostly of mixed blood, and who desire to throw off the yoke of monarchy and replace it by a republican form of government, a feeling which I know to be general, not only among the lower orders, but among the magistrates, priests, officers in the army, and owners of landed property, and hence I believe the time is not far distant, when Brazil will share the fate of the other South American states. In such an event the white population will be sure to suffer from the savage rapacity of the mixed races, especially those who have African blood in them: for it is to be remarked, that the worst of criminals spring from this class, who inherit in some degree the superior intellect of the white, while they retain much of the cunning and ferocity of the black; they are mostly free, and bear no good will towards the whites, who form the smaller part of the entire population. It should be observed, however, that in the class of wealthier landed proprietors and

commercial men, who have received the benefits of a more liberal education, especially those nearer the capital, and those belonging to the provinces along the coast, this tide of public opinion, that at one time nearly threatened the ruin of the empire, has been in a great measure arrested, and many of those who formerly advocated republican principles, are now the staunchest supporters of the constitutional monarchy, convinced of its being the strongest guarantee they can have for the security of their lives and property, and the development of the industry and resources of the empire.

In Brazil the mixed races receive different names from those in the Spanish territories. The offspring of Europeans and negroes are called *Mulattos*; those of Europeans and native Indians, *Mamelucos*; those of the negro and Indian, *Caboclos*; while those which spring from the mulatto and negro are called *Cabras*; the term *Creole* is applied to the offspring of the negroes.

I considered myself fortunate, shortly after my arrival at Rio, to make the acquaintance, and gain the friendship, of a family that had already travelled in distant parts of South America. It is only he who, day after day, is pursuing his solitary rambles through the dark forests, in the shady glens, on the mountain summits, or by the surf-beaten shores of such a country as Brazil, where all is new, and all is strange, who can fully estimate the privilege of being received with welcome into a family whose leisure hours are devoted to pursuits similar to his own. Many of my excursions in the vicinity of Rio, were undertaken in company with these friends; and to their local knowledge of the country I owe some of my finest

botanical acquisitions. To them, as well as to most of the English residents at Rio, I am indebted for many attentions during the different periods of my residence in that neighbourhood.

In order to present some general idea of the splendid scenery of the country, and the leading features of this part of Brazil, I will give an account of some of these excursions. There is a path by the side of the great aqueduct, which has always been the favourite resort of naturalists who have visited Rio; and there is certainly no walk near the city so fruitful either in insects or plants. The following notes were made on the return from my first visit along the whole length of the aqueduct. After reaching the head of the Laranjeiras valley, which is about two miles in extent, the ascent becomes rather steep. At this time it was about nine, A.M., and the rays of the sun, proceeding from a cloudless sky, were very powerful; but a short distance brought us within the cool shade of the dense forest which skirts the sides of the Corcovado, and through which our path lay. In the valley we saw some very large trees of a thorny-stemmed *Bombax*, but they were then destitute both of leaves and flowers, nearly all the trees of this tribe being deciduous. There we also passed under the shade of a very large solitary tree which overhangs the road, and is well known by the name of the Pao Grande. It is the *Jequetibá* of the Brazilians, and the *Couratari legalis* of Martius. Considerably further up, and on the banks of a small stream that descends from the mountain, we found several curious *Dorstenias*, and many delicate species of Ferns. We also added here to our collections fine specimens of the Tree-fern (*Tri-*

chopteris excelsa), which was the first of the kind I had yet seen. The forests here exhibited all the characteristics of tropical vegetation. The rich black soil, which has been forming for centuries in the broad ravines from the decay of leaves, &c., is covered with herbaceous ferns, *Dorstenias*, *Heliconias*, *Begonias*, and other plants which love shade and humidity; while above these rise the tall and graceful tree-ferns, and the noble Palms, the large leaves of which tremble in the slightest breeze. But it is the gigantic forest trees themselves which produce the strongest impression on the mind of a stranger. How I felt the truth of the observation of Humboldt, that, when a traveller newly arrived from Europe penetrates for the first time into the forests of South America, nature presents itself to him under such an unexpected aspect, that he can scarcely distinguish what most excites his admiration, the deep silence of those solitudes, the individual beauty and contrast of forms, or that vigour and freshness of vegetable life which characterize the climate of the tropics.* What first claims attention is the great size of the trees, their thickness, and the height to which they rear their unbranched stems. Then, in place of the few mosses and lichens which cover the trunks and boughs of the forest trees of temperate climes, here they are bearded from the roots to the very extremities of the smallest branches, with Ferns, *Aroideæ*, *Tillandsias*, *Cacti*, *Orchideæ*, *Gesneriæ*, and other epiphytous plants. Besides these, many of the large trunks are encircled with the twining stems of *Bignonias*, and shrubs of similar habit, the branches of which frequently became thick, and com-

* Personal narrative. 3. p. 36.

press the tree so much, that it perishes in the too close embrace. Those climbers, again, which merely ascend the trunk, supporting themselves by their numerous small roots, often become detached after reaching the boughs, and, where many of them exist, the stem presents the aspect of a large mast supported by its stays. These rope-like twiners and creeping plants, passing from tree to tree, descending from the branches to the ground, and ascending again to other boughs, intermingle themselves in a thousand ways, and render a passage through such parts of the forest both difficult and annoying.

Having reached, by mid-day, the level on which the water of the aqueduct is brought from its source, we continued our walk along it for upwards of two miles. Our progress, however, was slow, from the number of new objects continually claiming our attention. In damp shady spots by the side of the aqueduct we found the common water cress, (*Nasturtium officinale*) of Europe, which is one of the few plants that is truly cosmopolite; and on the rocks grew some little European mosses, which, being old acquaintances, recalled pleasing thoughts of home. Numerous ferns, and many strange-leaved *Begonias* grew along the side of the little stream. While collecting specimens of a moss, I had a providential escape from a poisonous snake; I caught it in my hand along with a handful of the moss, which was soon dropped when I perceived what accompanied it. Venomous snakes are not uncommon in the province of Rio de Janeiro; but accidents do not so often result from them as might be supposed.

About seven o'clock, P.M., we regained the spot where

we had left the servants, the horses, and the materials for our dinner; and by the time we had partaken of this repast, darkness had already set in. As the road is by no means of easy descent, even by day, we should not have thought of remaining so long, had we not been certain of moonlight. During the half hour we delayed for the rising of the moon, we listened to the sounds produced by the various animals which are in a state of activity at this hour of the evening. Pre-eminent above all the others, is that emitted by the blacksmith frog; every sound which he produces ringing in the ears like the clang of a hammer upon an anvil, while the tones uttered by his congeners strikingly resemble the lowing of cattle at a distance. Besides these, the hooting of an owl, the shrill song of the Cicada, and the chirping of grasshoppers, formed a continued concert of inharmonious tones; while the air was lighted up by the fitful flashes of numerous fireflies.

When the moon rose we continued our journey, but the lowering clouds, together with the dark shade of the overhanging trees, prevented our deriving much advantage from its light. When we emerged from the forest and gained a glimpse of the horizon, everything betokened an approaching storm. Towards the north lay a mass of the darkest clouds, whence streamed, from time to time, sheets of the most brilliant lightning. This continued till we reached home, shortly after ten o'clock, and we were scarcely seated when the storm broke forth in all its fury, accompanied with a deluge of rain.

From various parts of the watercourse fine views of the low country are obtained. The finest, perhaps, is that

which discloses the Lake of Rodrigo Freitas. We looked, as it were, through a large portal; on the left is the Corcovado covered with a dense forest of various tinted foliage, and on the right, the nearly perpendicular face of another mountain, covered with a few Cacti and other succulent plants, but richly wooded towards the summit. From this point there runs a long wide valley, at the bottom of which lies the Botanic Garden, and still further on, the lake. On the flat grounds by the shores of the lake are a number of cottages, surrounded by cultivated fields. Immediately beyond these the sea-shore, with its broad belt of white sand on which a heavy surf is always breaking. All beyond, with the exception of a small island or two to the left, is the great Southern Atlantic Ocean, bounded by the blue sky. In the course of our walk we often sat down to rest ourselves, and to enjoy, in the silence and repose which surrounded us, the romantic prospects which were constantly presenting themselves.

The Corcovado mountain offers a rich field to the Botanist. I frequently visited the lower portions, but only once ascended to the summit. The ascent is from the N. W. side, and although rather steep in some places, may be ridden on horseback all the way up. Some of the trees on the lower parts of it are very large. The thick underwood consists of *Palms, Melastomaceæ, Myrtaceæ, Tree-ferns, Crotons, &c.*; and beneath these are many delicate herbaceous ferns, *Dorstenias, Heliconias,* and, in the more open places, a few large grasses. Towards the summit the trees are of much smaller growth, and shrubs belonging to the genus *Croton* are abundant,

as well as a small kind of bamboo. The summit itself is a large mass of very coarse-grained granite. In the clefts of the rocks grow a few small kinds of Orchideous plants, and a beautiful tuberous-rooted scarlet-flowered *Gesneria*. From this point a magnificent panoramic view of the bay, the city, and the surrounding country is obtained. The temperature at this elevation is so much reduced, that it is not difficult to fancy one's self suddenly transported to a higher latitude. A strong breeze was blowing, and just before leaving, the top of the mountain became enveloped in one of those dark clouds which so frequently hang over it towards the beginning of the rainy season.

Another interesting journey made during my stay at Rio, was to the Tijuca mountains, whither I was accompanied by a friend, and where we remained ten days. Instead of the direct road from Rio, we preferred the worst and more circuitous one which leads along the shore. Near the sea, and about fifteen miles distant from the city, rises the Gavea, or Topsail Mountain, so called from its square shape, and well known to English sailors by the name of Lord Hood's Nose. It has a flat top, and rises about two thousand feet above the level of the sea, to which it presents a nearly perpendicular precipitous face. We remained a night at the house of a Frenchman, who possesses a small coffee estate. The coffee is planted on the rocky sloping ground which lies between the base of the mountain and the sea. The situation is cool, and possesses a moist climate. Among the loose rocks at the foot of the mountain we made a fine collection of beautiful land-shells, and on the rocks by the sea shore, we

found the beautiful *Gloxinia speciosa*, which is now so common in the hot-houses of England, growing in the greatest profusion, and covered with flowers. Along with it grows a kind of wild Parsley, and, twining among the bushes, a new kind of Indian cress (*Tropæolum orthoceras*, Gardn.). On the face of the mountain, at an elevation of several hundred feet, we observed some large patches of one of those beautiful large-flowered Orchideous plants which are so common in Brazil. Its large rose-coloured flowers were very conspicuous, but we could not reach them. A few days afterwards we found it on a neighbouring mountain, and ascertained it to be *Cattleya labiata*. Those on the Gavea will long continue to vegetate, far from the reach of the greedy collector.

The road, after winding round the Gavea, terminates at a small salt-water lake, which passengers, who follow this route, are obliged to cross, or rather to pass from one end to the other, in consequence of the flank of a high hill which runs into it, and prevents a passage along its margin. We passed the lake in a rotten leaky canoe, and saw on the face of the steep rocks many curious plants which we could not reach. The path which led to the house where we were to take up our quarters, lay for about two miles through a flat meadow-land, partly in its original state, and partly planted with Indian corn, Mandiocca, and Bananas. We passed many small habitations belonging to poor people of colour, mostly fishermen. Before reaching the foot of the mountain over which the road leads to Tijuca, we passed a migrating body of small black ants. The immense number of individuals comprising it may be imagined from the fact, that the column was

more than six feet broad, and extended in length to upwards of thirty yards. The ground was completely covered with the little creatures, so closely were they packed together. The natural history of ants has as yet been but little studied, particularly with regard to the enumeration of species. They are more numerous than naturalists are aware of. In those parts within the tropics where humidity prevails, they are neither so varied in species, nor so abundant in individuals, as in the drier districts. While residing at Pernambuco, I remember taking notice of all the species I met with in the course of a single day, and they amounted to about twenty-five.

Before ascending the hill we visited the falls of Tijuca, which are only at a short distance from the road. The crystal water of a large rivulet falls over two successive gently inclined masses of rock, upwards of one hundred feet high. It rather glides in a broad broken sheet than falls, and is received in a large pool below. This cascade reminded me of those which are so often to be met with in the wooded glens of Scotland. By dusk, after gradually ascending the mountains, we reached the house; it is situated in an old coffee plantation, belonging to a Brazilian nobleman, but it was then rented by a party of young English merchants in Rio, who used it as a holiday resort, and, by the kindness of one of them, we were allowed to remain at it for a few days.

Early on the following morning we made an excursion to a mountain called the Pedra Bonita, immediately opposite the Gavea. In our way thither we visited the coffee plantations of Mrs. Moke, and Mr. Lescene. They adjoin each other, and were then considered the best managed

near Rio. The great coffee country is much further inland, on the banks of the Rio Parahiba. The trees are planted from six to eight feet apart. Those plants which have been taken from the nursery with balls of mould round their root are found to bear fruit in about two years, whereas those which have been detached from the earth do not produce till the third year, and a greater proportion of the plants die. They are planted when about a foot high, on the slopes of the hills, in the alluvial soil from whence the virgin forest has been cleared. They are only allowed to grow to the height of from ten to twelve feet, so that the crop may lie within reach. Till the trees are in full bearing, one negro can take charge of, and keep clean, two thousand plants; but afterwards only half that number is allotted him. Large healthy coffee trees have been found to produce as much as from eight to twelve pounds of coffee; the average produce, however, varies from a pound and a half to three pounds. When the berry is ripe, it is about the size and colour of a cherry; and of these berries a negro can collect about thirty-two pounds daily. In the course of the year there are three gatherings, but the greater part of the crop ripens during the dry season. The berries are spread out to dry in the sun, on large slightly convex floors; the dry shell is afterwards removed, either by mills, or by a series of large wooden mortars. It is only in some few estates in Brazil that the pulper is seen, which is so commonly used in the West Indies and Ceylon, for taking off the pulp from the fresh berries. Nothing is more beautiful than a coffee plantation in full bloom; the trees come into flower at the same time, but the blossoms

do not last more than twenty-four hours. Seen from a distance the plantation seems covered with snow; and the flowers have a most delightful fragrance.

By the side of a stream which flows through the valley where these plantations are, we noticed a nettle-like tree, with a stem eight inches in diameter, and nearly twenty feet high, which proved to be a new species of *Bœhmeria* (*B. arborescens*, Gardn.). For a considerable way our ascending path was bordered with bitter orange trees, the shade afforded by which was no less acceptable than their fruit was grateful; for the juice though a little bitter is not disagreably so. Both here, and in many other parts about Rio, this bitter kind of orange grows apparently wild; it is called the wild orange by the Brazilians (*Laranja da Terra*), but it is certainly not indigenous. Thence, we came to a tract where the original forest having been felled, was replaced by a thick wood of young trees, consisting chiefly of arborescent *Solanums*, *Crotons*, *Vernonias*, *&c.*, while great numbers of *Cecropiæ peltata* and *palmata*, reared their heads above the rest, conspicuous at a great distance from their white bark, their branches growing at right angles to the trunk, and their large lobed leaves, the snowy under-surface of which, when agitated by the wind, gives the tree the appearance of being covered with large white blossoms.

Near the summit of the Pedra Bonita, there is a small Fazenda, or farm, the proprietor of which was then clearing away the forest which covers it, and converting the larger trees into charcoal. From the massive trunks of some of them which had just been felled, we obtained some very pretty Orchideous plants. Several of the

larger denizens of the forest, and found to belong to the natural orders *Melastomaceæ*, *Myrtaceæ*, *Compositæ*, and *Leguminosæ*. The ascent of the Pedra Bonita is made from the north side. Immediately on emerging from the forest, and attaining the summit, a most magnificent view of the surrounding country presented itself. It was then nearly sun-set, so we had but little time for botanizing. We only saw enough to convince us that the vegetation of the top of this mountain had a very different character from those of any others we had visited near Rio; resembling more, as I have since ascertained, that of the mountains of the interior. A few days afterwards we made another journey to it, but on this occasion the whole mountain was enveloped in clouds, the minute globules of which they were composed being distinctly visible, as they swept past under the influence of a strong breeze which was blowing from the north. A great part of the top we found to be covered with the beautiful lily-like *Vellozia candida*, on the branches of which grew a pretty *Epidendrum*, with rose-coloured flowers. Along with the *Vellozia* grew two beautiful subscandent species of *Echites*,* one with large dark violet-coloured flowers, the other with white ones of a similar size. They both exhale an odour not unlike that of the common primrose, but more powerful. On the edge of a precipice on the eastern side, we found, covered with its large rose-coloured flowers, the splendid *Cattleya labiata*, which a few days before we had seen on the Gavea.

The following year, in my return from the Organ Mountains, I again visited this spot, and found that a great

* *Echites atroviolacea*, Stadelm., and *E. crassinoda*, Gardn.

change had taken place. The forest, which formerly covered a considerable portion of the summit, was now cut down and converted into charcoal; and the small shrubs and *Vellozias* which grew in the exposed portion, had been destroyed by fire. The progress of cultivation is proceeding so rapidly for twenty miles around Rio, that many of the species which still exist, will in the course of a few years, be completely annihilated, and the botanists of future times who visit the country, will look in vain for the plants collected by their predecessors.

Other excursions to the islands in the bay, and to Jurujuba, on the opposite side of it, were also productive of many interesting species of plants. It was at the latter place, on dry bushy hills, that I first saw the really beautiful *Buginvillea spectabilis* growing wild. It climbs up into the tops of the bushes and trees near which it grows, and the brilliant colour of the flowers, which it produces in the greatest profusion, renders it conspicuous in the woods at a great distance. This, as well as the equally beautiful *Bignonia venusta*, are much cultivated as ornamental climbers in the suburbs.

Before leaving Rio I visited the Botanic Garden, and the Museum of Natural History. The former, as has already been observed, is situated at the foot of a valley near the sea, about eight miles to the south-west of the city. It is more a public promenade than a Botanic Garden, for, with the exception of a few East Indian trees and shrubs, and a few herbaceous European plants, there is but little to entitle it to that name. Of the immense number of beautiful plants indigenous to the country, I saw but few. The European botanist is,

however, well recompensed for his visit, by the sight of some large Bread-fruit-trees and the Jack, with its much smaller entire leaves, and monstrous fruit pendant from the stem and large branches. There are also some fine Cinnamon and Clove trees. Near the centre of the garden several clusters of Bamboos, with stems upwards of fifty feet in height, give it a marked tropical character. The avenue which leads up from the entrance, is planted on each side with the pine-like *Casuarina*. It is on a piece of ground, about an acre in extent, on the left hand side of this avenue, that the Tea plants grow which were imported from China by the grandfather of the present Emperor. It was thought that the climate and soil of Brazil would be suitable for its cultivation, but the success of the experiment has not equalled the expectations which were formed of it, notwithstanding that the growth of the plants, and the preparation of the leaves, were managed by natives of China accustomed to such occupations. In the province of San Paulo a few large plantations of Tea have been established; that belonging to the ex-regent Feijó, containing upwards of 20,000 trees. The produce is sold in the shops at Rio, and in appearance is scarcely to be distinguished from that of Chinese manufacture, but the flavour is inferior, having more of an herby taste. It is sold at about the same price, but it is now ascertained that it cannot be produced, so as to give a sufficient recompense to the grower, the price of labour being much greater in Brazil than in China. To remunerate, it is said that Brazil Tea ought to bring five shillings per pound.

The National Museum of Natural History was founded

by Don John the sixth. It gives but a poor idea of the vast stores of animated nature which exist in the country. Like many other Museums, more attention has been given to the cases than to their contents. The collection is contained in a building of moderate size, in the Campo de Santa Anna There are some eight apartments which visitors are allowed to enter, one of these is devoted to the dresses, ornaments, arms, &c., of the aborigines of Brazil; another contains a number of cases of stuffed birds, foreign as well as indigenous, badly prepared, and but few of them named; another has a few mummy cases ranged along one side of it, from one of which the body has been taken, and placed in a glass case; the bindings have been unrolled from the head and feet, and both these parts are fully exposed. There are also in this room a very limited collection of coins and medals, and a few paintings, one of which is a full-length portrait of the founder. Another apartment contains a few cases of quadrupeds, chiefly monkeys. Two rooms are allotted to a collection of minerals, which is the most extensive as well as the most interesting portion of the contents of the institution; the specimens are mostly European. The Museum is thrown open to the public every Thursday, from ten till four o'clock, and appears to be well frequented.

CHAPTER II.

JOURNEY TO AND RESIDENCE IN THE ORGAN MOUNTAINS.

Principal Summer Resort of the English Residents—Journey from Piedade to Magè and Frechal—Ascent of the Mountains—Description of Virgin Forests—Mr. March's Plantation in the Serra—Treatment of his Slaves—Case of One bitten by a venomous Snake—Limb amputated by the Author—Mode of Treatment in such Cases among the Natives—Charms—Tapir-Hunting in the Mountains—Beasts, Birds, and Reptiles found there—Visit to a Brazilian Fazendeiro—To Constantia—Ascent of the loftiest Peaks—Vegetable Productions in those elevated regions—Pleasant Sojourn on the Estate.

THE collections which had accumulated during the period of my residence in the vicinity of Rio de Janeiro, having been put into a proper state and sent to England, I made arrangements for visiting the Organ Mountains. The peaks which receive this appellation form part of a mountain range, situated about sixty miles to the north of Rio, which, branching out in various directions, stretches from about Bahia, in lat. 12° S., to S. Catharina, in lat. 29° S. The name (Serra dos Orgãos) bestowed on them by the Portuguese, originated in a fancied resemblance which the peaks, rising gradually one above the other, bear to the pipes of an organ. About ten years before my visit a Sanatorium, or health station, had been established on this range, at about 3,000 feet above the level of the sea,

in a beautiful valley behind the higher peaks. A large tract of country there belongs to Mr. March, an English gentleman, on which he has a farm for the breeding of horses and mules, and a large garden, from which the Rio market is regularly supplied with European vegetables. On this property a number of cottages have been erected, which are resorted to by the families of the English residents at Rio during the hot months. He also receives boarders into his own house, and it rarely happens that the place is without visitors. About one third of the journey has to be performed by water, the other is accomplished on mules, which are sent down from Mr. March's farm (Fazenda).

As Mr. March happened to be in Rio at the time I purposed visiting the mountains, we started together, on the 24th of December, along with two or three English merchants, who were going up to spend the Christmas holidays with their families. It was mid-day before we could leave the city, and, under the influence of a strong sea-breeze, we reached Piedade, the landing place, at half past three o'clock, the distance being about twenty miles. The boat in which we embarked belongs to a class which is very common in the harbour, and much employed in conveying goods to the head of the bay, and produce from the interior, from thence to Rio. They are also much made use of by pleasure parties frequenting the islands and opposite shores of the bay. They are called Faluas, and are manned by six rowers, and a steersman who is called the Patrão. The latter is very frequently the owner, and most of them are natives of Portugal. They have two masts, each of which carries a large sail;

the stern part is covered over and enclosed with curtains. The negroes who man these boats are generally strong muscular men. Seated on one thwart, they place their feet against another, and rise up at each stroke of the oar, keeping time to a melancholy chant all the time they are pulling. These boats can be hired for an entire day at about eighteen shillings.

The day was a most delightful one, the sun shining out brightly from a clear sky, and the air cooled by the fresh sea-breeze. We passed close to the Ilha do Governador, which is the largest island in the bay. It is about eight miles in length, but narrow in proportion, and thinly inhabited. Shortly before my arrival in the country, an Englishman commenced a soap and candle manufactory on it, both of which articles bring the same price in Rio as those imported from Europe. The muddy shores of this island, as well as those of the whole bay, abound with crabs of all sizes, and every variety of colour, from nearly black to a bright scarlet. On one occasion when I visited the island, I observed within a very short space about eight species. They are gregarious, and each kind inhabits a distinct colony; they burrow in the mud, under the shade and among the roots of the mangrove and other shore-loving trees. It was here that I first saw the apparent phenomenon of trees bearing crops of oysters. These animals, when young, attach themselves to the lower part of the trunks, and long pendulous roots, of the mangrove and other trees, which grow in the sea even to low-water mark. These oysters are small and not well-flavoured. Others are found in the bay of enormous size, some of their shells, which I collected as

specimens, measuring upwards of a foot in length. Near the head of the bay there are many little islands, some of which are inhabited, and present the agreeable prospect of cultivation, while others are little more than masses of rock, among the clefts of which grow a few stunted shrubs, and grotesque prickly pears.

At Piedade, mules from Mr. March's Fazenda were waiting for us and our luggage, and, after a short stay for the arrangement of the latter, we began the land part of our journey. At Piedade, which only consists of a few scattered houses, a large hotel was being erected by Col. Leite, a Brazilian gentleman, who, at his own expense, was then making a new road across the Organ Mountains, to join the one which leads to the mining districts from Porto de Estrella, another landing place at the head of the bay. The latter place has hitherto been the common harbour between Rio and the interior. The Colonel, however, expects that his new road will ultimately be preferred, as it is much shorter. Four years after, when I again visited this part of the country, I found that this new road was still in an unfinished state. To save the expense of an engineer he had traced the road himself, and the consequence was, that it afterwards required many alterations. The road from Piedade to Magé, a small town about four miles distant, leads through a flat, sandy, and, in several places, marshy plain, covered with low trees and beautiful flowering shrubs. The hedges were covered with numerous climbers, one of them a small sweet-flowered kind of Jasmine, the only one which has hitherto been found in a wild state on the continent of America. In moist places, *Dichorizandra thyrsiflora*,

with its spikes of azure blossoms, was not uncommon, while the sandy fields were covered with a large kind of *Cactus*, among which many plants of the aloe-like *Fourcroya gigantea* were to be seen throwing up their flowering stems to a height of thirty and forty feet.

The town of Magé is rather prettily situated on the banks of the Magé-assú, one of the many small rivers which take their rise in the Organ Mountains, and fall into the head of the bay. It contains a neat church, and a number of well-furnished shops. The river is navigable, for craft of a small size, about eight miles from its mouth. A considerable quantity of Farinha de Mandiocca (Cassava) is exported from this place to Rio. Its low situation, and the surrounding swamps, render it unhealthy at particular seasons; intermittent fevers are here common, and they frequently terminate in others of a more malignant nature. From Magé to Frechal, the place where we slept for the night, the distance is about fourteen miles. The road still continued flat, but wound round many low hills, the sides of which are covered with plantations of Mandiocca. We met several troops of mules coming down from the interior, loaded with produce. Unaccustomed to such a mode of transport, the European looks with astonishment at the great number of animals which are here required to carry what, in his own country, would scarcely form a load for one. Loaded mules start daily from Rio, Piedade, and Porto d'Estrella, to make journeys into the interior of from five hundred to two thousand miles and upwards. They seldom travel above twelve or sixteen miles a day, and the load allowed to each varies from six to eight arrobas of thirty-two

pounds each. The loads are protected from the weather by dried ox-hides, which are strapped lightly over them. Frechal is a small village, consisting of a few scattered houses, and situated about two miles from the foot of the mountains. The place at which we put up for the night is a large kind of public house (Venda), where there is an open room for the accommodation of travellers; around this room a number of beds are arranged, which gives it very much the appearance of a hospital ward. Here, unlike most other places of the same kind between Rio and the mining districts, a very comfortable meal may always be obtained.

Next morning by break of day we again continued our journey. At about two miles from Frechal the ascent of the mountains begins. From thence to Mr. March's Fazenda, which stands at an elevation of upwards of 3,000 feet above the level of the sea, is twelve miles. During the whole way the road is very bad, and in many places so steep, that it is with considerable difficulty the mules make their way up it. Indeed, to one unused to travel on such paths, which have more the appearance of the bed of a mountain torrent than a road for beasts of burden, many parts of it appear impassable; but he is soon undeceived by the slow yet sure manner in which the mules pass along the worst portion of it, especially if left entirely to themselves. The whole length of the road is through one dense forest, the magnificence of which cannot be imagined by those who have never seen it, nor penetrated into its recesses. Those remnants of the virgin forest which still stand in the vicinity of the capital, although they appear grand to the eye of a newly-

arrived European, become insignificant when compared with the mass of giant vegetation which clothes the sides of the Organ Mountains. So far as I have been able to determine, the large forest trees consist of various species of *Palms*, *Laurus*, *Ficus*, *Cassia*, *Bignonia*, *Solanum*, *Myrtaceæ*, and *Melastomaceæ*. In temperate climates natural forests are mostly composed of trees which grow gregariously. In those of tropical countries it is seldom that two trees of a kind are to be seen growing together, the variety of different species is so great. Many of the trees are of immense size, and have their trunks and branches covered with myriads of those plants which are usually called parasites, but are not so in reality, consisting of *Orchideæ*, *Bromeliaceæ*, *Ferns*, *Peperomiæ*, &c., which derive their nourishment from the moisture of their bark, and the earthy matter which has been formed from the decay of mosses, &c. Many of the trees have their trunks encircled by twiners, the stems of which are often thicker than those they surround, This is particularly the case with a kind of wild fig, called by the Brazilians, Cipo Matador. It runs up the tree to which it has attached itself, and at the distance of about every ten feet throws out from each side a thick clasper, which curves round, and closely entwines the other stem. As both the trees increase in size, the pressure ultimately becomes so great, that the supporting one dies from the embrace of the parasite.

There is another kind of wild fig-tree, with an enormous height and thickness of stem, to which the English residents give the name of Buttress-tree, from several large thin plates which stand out from the bottom of the trunk.

They begin to jut out from the stem at the height of ten or twelve feet from the bottom, and gradually increase in breadth till they reach the ground, where they are connected with the large roots of the tree. At the surface of the ground these plates are often five feet broad, and throughout not more than a few inches thick. The various species of *Laurus* form fine trees; they flower in the months of April and May, at which season the atmosphere is loaded with the rich perfume of their small white blossoms. When their fruit is ripe, it forms the principal food of the Jacutinga (*Penelope Jacutinga*, Spix), a fine large game bird. The large *Cassiæ* have a striking appearance when in flower; and, as an almost equal number of large trees of *Lasiandra Fontanesiana*, and others of the *Melastoma* tribe, are in bloom at the same time, the forests are then almost one mass of yellow and purple from the abundance of these flowers. Rising amid these, the pink-coloured flowers of the *Chorisia speciosa*—a kind of silk cotton-tree—can be easily distinguished. It is also a large tree, with a stem, covered with strong prickles, from five to eight feet in circumference, unbranched to the height of thirty or forty feet. The branches then form a nearly hemispherical top, which, when covered with its thousands of beautiful large rose-coloured blossoms, has a striking effect when contrasted with the masses of green, yellow, and purple of the surrounding trees.

Many of these large trunks afford support to various species of climbing and twining shrubs, belonging to the natural orders *Bignoniaceæ*, *Compositæ*, *Apocyneæ*, and *Leguminosæ*, the stems of which frequently assume a very

remarkable appearance. Several of them are often twisted together and dangle from the branches of the trees, like large ropes, while others are flat and compressed, like belts: of the latter description I have met with some six inches broad, and not more than an inch thick. Two of the finest climbers are the beautiful large trumpet-flowered *Solandra grandiflora*, which, diffusing itself among the largest trees of the forest, gives them a magnificence not their own; and a showy species of Fuchsia (*F. integrifolia*, Cambess.)*, which is very common, attaching itself to all kinds of trees, often reaching to the height of from sixty to one hundred feet, and then falling down in the most beautiful festoons.

At the foot of the mountains the underwood principally consists of shrubs belonging to the natural orders *Melastomaceæ*, *Myrtaceæ*, *Compositæ*, *Solanaceæ*, and *Rubiaceæ*, among which are many large species of herbaceous ferns, and a few palms. About the middle, palms and tree-ferns abound, some of the latter reaching to a height of not less than forty feet. These trees are so unlike every other denizen of the forest, so strange in appearance, yet so graceful, that they have always attracted my attention more than any other, not even excepting the palms. At an elevation of about 2,000 feet, a large species of bamboo (*Bambusa Tagoara*, Mart.), makes its appearance. The stems of this gigantic grass are often eighteen inches in circumference, and attain a height of from fifty to one hundred feet. They do not, however, grow perfectly upright, their tops forming a graceful curve downwards.

* This species I have ascertained to be identical with *F. affinis*, Cambess.; *F. pyrifolia*, Presl.; and *F. radicans*, Miers.

Throughout the whole distance, the path was lined on each side with the most beautiful herbaceous plants, and delicate ferns.

We reached Mr. March's Fazenda early in the forenoon. His estate embraces an extent of country containing sixty-four square miles. The greater part of it is still covered by virgin forests; that which is cleared, consists of pasture land, and several small farms for the cultivation of Indian corn, French beans, and potatoes. Plentiful crops are yielded of the two former, but the produce of the latter is neither so abundant nor so good as in England. He has also near his house a large garden, under the management of a French gardener, in which nearly all the European fruits and vegetables grow tolerably well. The peach, the olive, the fig, the vine, the apple, the quince, the loquat, the pear, the orange, and the banana, may be seen growing side by side, and all, with the exception of the two latter, bearing abundance of fruit. The orange and the banana also bear, but the cold seldom allows the fruit to come to perfection. The strawberry yields but little fruit, and the gooseberry none at all. The apples are quite equal to any I have tasted in England, but the peaches are very inferior; bushels of them are given to feed the pigs. The figs are delicious, especially a variety which produces small green-coloured fruit. Excellent crops of cauliflower, cabbage, asparagus, artichokes, turnips, carrots, peas, onions, &c., are freely produced, and sent weekly to the city. The most fertile part of the estate is a large valley, situated between the higher chain of the Organ Mountains and a smaller range which runs nearly parallel with it, and many of the

smaller vallies, which run up to the peaks themselves, are cultivated; these are all well watered with small streams of cool and limpid water.

At this elevation the climate is very much cooler than it is at Rio, the thermometer in the months of May and June sometimes falling as low as 32° just before day-break. The lowest at which I observed it myself, was on the 26th of May, when, at 8 o'clock, A.M., the mercury indicated 39°. The highest to which it rose during the six months I resided on the mountains, was on the 23rd of February, when the mercury stood at 84° at noon. The hot season is also the season of the rains, and violent thunder storms occur almost daily, during the months of January and February. They come on with great regularity about four o'clock in the afternoon, and when they pass over, leave a delightfully cool evening. Like the mountains near Rio, the whole of the Organ range consists of granite. The alluvial soil is very deep and rich in the vallies, and underneath it there exists the same red-coloured argillaceo-ferrugineous clay which is so common at Rio.

It being Christmas-day on which we arrived, and a great holiday, we found the whole of the slaves belonging to the estate, amounting to about one hundred, dancing in the yard before the house, and all attired in new suits of clothes, which had been sent out to them the day before. In the evening, a party of the best conducted, principally creoles, were admitted into the verandah of the house, where I had a good opportunity of witnessing their dances—some of them not being very delicate. One of the best was a kind of dramatic dance, of which the

following is a programme. Near the door of a house belonging to a Padre (Priest), a young fellow commences dancing and playing on the viola, a kind of guitar. The Padre hears the noise, and sends out one of his servants to ascertain the cause. He finds the musician dancing to his own strains, and tells him that he is sent by his master to enquire why he is thus disturbed. The musician tells him that he is making no disturbance at all, but only trying a new dance from Bahia, which he saw the other day in the Diario. The servant asks if it is a good one; "Oh, very good," replies the other, "will you not try it?" The servant claps his hands, cries "Let the Padre go sleep!" and immediately joins in the dance. The same thing is repeated till the Padre's servants, men, women, and children, amounting to about twenty, are dancing in a circle before the house. Last of all the supposed Padre himself makes his appearance in a great rage, dressed in a large Poncho for a gown, a broad-brimmed black straw hat, and a mask with a long beard to it. He demands the cause of the noise, which, he says, prevents him from enjoying his dinner. The musician tells him the same story that was told to his servants, and, after much persuasion, gets him to join in the dance also. He dances with as much zeal as any of them, but, watching his opportunity, he takes out a whip which he has concealed under his gown, and, lashing the whole of them out of the apartment, finishes the performance. A stricter discipline is kept up among the slaves on this estate, than on any other of the same size I have been on in Brazil, but, at the same time, they are carefully and kindly attended to. There is a hospital for the

sick, and Mr. Heath, the manager of the estate, has had great experience in the treatment of those diseases to which negroes are liable.

Although there are not so many kinds of venomous snakes in Brazil as is supposed even by the inhabitants, yet accidents frequently occur from their bites to those slaves who are engaged in the plantations. In the whole course of my travels in Brazil, I did not meet with more than half a dozen kinds which, from examination, were found to have poison fangs. Some of these are, however, very numerous in individuals, In the province of Rio, and in the southern provinces generally, the Jararáca, (*Bothrops Neuwiedii*, Spix.), a genus nearly allied to that which the Rattle Snake belongs to, is perhaps the most common. When full grown it is usually about six feet long. It is frequently met with in plantations, and in bushy and grassy places by the sides of woods, but is scarcely ever found in dense forests. That which is most abundant in the central and northern provinces, is a true Rattle Snake (*Cascavel*), but most probably a distinct species from that of North America. On the day previous to my arrival at Mr. March's, one of his female slaves, about thirty-two years of age, and the mother of four children, whilst weeding Indian corn on a plantation about eight miles distant from the house, was bitten on the right hand, between the bones of the fore finger and thumb, by a Jararáca. The accident took place about eight o'clock in the morning, and immediately after she left to return home, but only reached half way, when she was obliged to lie down from excessive pain and exhaustion. At this time she said the feeling of thirst was very

great. Some slaves belonging to the estate, happening to be near, one of them rode off to inform Mr. Heath. When he arrived, he found the arm much swollen up to the shoulder, beneath which he applied a ligature. From a cottage in the neighbourhood, he got a little hartshorn, some of which he applied to the bite, and caused her to swallow about a tea-spoonful in water. Being in a state of high fever, he took about a pound of blood from her, after which she became faintish. She was then removed to the Fazenda, and had two grains of calomel administered to her, and about an hour after a large dose of castor oil.

When I saw her on the following day, she still complained of excruciating pain in the hand and arm, to relieve which a linseed meal poultice was applied. The pulse being 130, and full, about another pound of blood was taken from the other arm. Next day a number of little vesicles made their appearance on the back of the hand and a little above the wrist, which, when opened, discharged a watery fluid. For the next two days she continued to suffer much pain, to relieve which poultices were constantly applied. More vesicles formed, and the cuticle began to peel off in the vicinity of the bite. On the morning of the 29th, that is, on the fourth day after the accident, when the poultice was removed, she complained of no pain at all in her hand, and on careful examination I found that gangrene had taken place, all below the wrist being dead. From the state of the arm, there was every appearance of the mortification extending. On making an incision into the living portion above the wrist, a considerable quantity of a very fœtid whitish

watery fluid discharged itself; and, on pressing the arm between the finger and thumb, a crepitation was felt from the air which had generated beneath the integuments. She was now very weak, the pulse 136, small and feeble, and she appeared to be fast sinking. Amputation being the only means that seemed to offer her a chance of recovery, I decided at once to take off the arm. As the crepitation extended to a few inches above the elbow, and the swelling itself to the shoulder, I determined to take it off as close to the latter as possible. As there was no room for the application of the tourniquet, I got Mr. Heath to apply pressure with a padded key over the artery where it passes under the clavicle, and Mr. March held the arm while I performed the operation. A good deal of blood was lost before I could secure the artery, which had to be done before the bone was sawn through. In a fortnight after, the stump had nearly healed up, and she was walking about the room. Four years afterwards I again saw her, and her general health had not suffered in the least, but she had become extremely irritable and ill-tempered.

Neither the natives nor the inhabitants have any remedy for snake bites, in which they put implicit faith. This I found out from their frequently applying to me for medicine, after their own resources had been completely exhausted. When an accident of this nature happens, the patient, in the interior particularly, is generally put under the charge of a class of people called Curadores, who apply their remedies with many mysterious ceremonies. The first operation of the Curador is to suck the wound, which, if immediately had recourse to, I believe to be the

next best thing to excision or cauterization. The patient is then put into a dark room, and care is taken that he is not exposed to currents of air. One of the remedies which they believe to be the most efficacious, is that which is well known in Minas and the other inland provinces, by the name of Black Root (*Raiz Preto*), and Snake Root (*Raiz de Cobra*). It is the root of a common shrub, now well known to botanists by the name of *Chiococca anguifuga*. It has a pungent disagreeable smell, not unlike that of the common Valerian. Decoctions of this are given to drink, and poultices of it are applied to the wound. The *Raiz Preto* acts as a violent emetic and purgative, and also induces copious perspiration. If it operates freely in this manner, they augur favourably of the patient's recovery. Besides this plant they use many others. Snakes have generally a disagreeable musky smell, and it is a common opinion among the people, that any plant possessing one similar, is sure to be valuable in the cure of their bites.

In the province of Pernambuco, I found that a common method of cure was to give the patient rum to drink, till he was in a perfect state of intoxication; and this they affirm is very frequently a successful remedy. But the most extraordinary method of cure which I have ever heard of, is one which was communicated to me by a farmer (Fazendeiro) who accompanied me to Rio, on my return from the mountains. Only three days, he said, before he left his estate, one of his oxen was bitten on the leg by a Jararáca, but having immediately applied his remedy, it became as well as any of the others before he quitted home. This remedy consists of the following

well-known Latin acrostic, or, as he termed them, magical words :—

S. A. T. O. R.
A. R. E. P. O.
T. E. N. E. T.
O. P. E. R. A.
R. O. T. A. S.

Each line is to be written separately on a slip of paper, and then rolled into the form of a pill, the whole five to be given as soon as possible after the person or animal has been bitten. He also gave me quite as ridiculous a remedy for the cure of drunkenness. This was to place a piece of bread in the arm-pits of a dying man, and allow it to remain there till he was perfectly dead. The smallest portion of this bread, he affirmed, given, without their knowledge, to those addicted to intemperance, would produce a perfect cure.

Catesby mentions that in North America he has seen death result from the bite of a Rattle Snake in less than two minutes; I have also heard of death taking place very shortly after the bite in Brazil, but I have never actually seen it in less than ten or twelve hours. In those cases where the poison acts so quickly, it must be so strong as to destroy the nervous energy at once. In those in which the patient lingers for one or more days, death generally takes place from inflammation and mortification of the subcutaneous cellular substance. During the course of my journeys in the interior, I met frequently with persons who had recovered from severe snake bites, but almost all of them had broken constitutions, and suffered from ulcerated limbs. From all that I have seen,

I candidly confess, that I have no faith in any medicine intended to act as a specific for a snake bite, whether used internally or externally. I do not of course allude to those which are usually applied for the reduction of inflammation and fever, as under any mode of treatment they cannot be withheld. A ligature attached above the wound, and instant incisions into the wound itself, and the application of a cupping-glass, which, in the shape of a wine glass, is always at hand, is more to be depended on than any other external remedial agency.

My first journey of any length into the virgin forest here, was made in company with M. Lomonosof, the Russian minister at the court of Brazil, and Mr. Heath. M. Lomonosof was desirous to witness a Tapir (*Anta*) hunt, that animal being very common on this range. It is the largest South American quadruped, but is not of greater size in the body than a calf about six months old, and it stands upon much shorter legs. We left the Fazenda about half past six o'clock in the morning, and entered the forest at about three miles to the north of it. We were accompanied by four negroes, and took provisions with us for two days. We had also our guns and six good dogs. For the first mile and a half we had a tolerable path, leading through a forest of fine trees, with very little underwood except young palms, hundreds of which were cut down by the blacks who were clearing the way for us. In going up the valley we crossed and re-crossed a small river, called the Imbuhy, several times, on the banks of which I added largely to my botanical collections. The most difficult part of our path, was about half a mile which had to be cut through

a thick forest of bamboos. Having accomplished this, we came upon an old track of a tapir. It was about two feet broad, well beaten, and had foot marks of the animal on it, but they were several days old. This path led us through a densely wooded part of the forest, to one which was less so, the larger trees being fewer, but instead, an abundance of shrubs and large herbaceous plants. We here came upon several paths which we found led to a deep pool in the river, and evidently a place where the tapir repairs to for the purpose of drinking and bathing. While Mr. Heath was endeavouring to get the dogs upon a recent track, I occupied myself in collecting a number of curious plants, which grew on a sloping bank by the side of the stream. It now began to rain, and the dogs not having gone out, we again crossed the river and proceeded up the valley about a mile further. From thence one of the dogs set off, but returned in about a quarter of an hour without having turned up anything. It was now nearly four o'clock in the afternoon, and the rain was beginning to fall heavily; we therefore sought for a place where we might encamp for the night, as we were ten miles distant from the Fazenda, and M. Lomonosof was too much fatigued to be able to return. The place we selected was under the shade of some large trees, near which grew abundance of the small cabbage palm (*Euterpe edulis*, Mart.), the terminal bud of which is so much made use of as a vegetable by the Brazilians. A hut was soon erected, and thickly thatched over with the leaves of this palm. At first we were dreadfully annoyed by mosquitos and a little sand-fly, but the kindling of a large fire in front of our hut soon dispersed them. Palm leaves were

spread upon the floor for our bed, and we had a small log of wood for a pillow. It rained heavily all night but we did not suffer from it. We got up next morning by break of day, and prepared to return home, as it still continued to rain. I was somewhat amused at the vessel in which the blacks cooked their breakfast. It was a pot made from a part of the thick stem of a bamboo, the bottom being formed by the division which occurs at each joint. It is placed upright on the fire, and so long as it contains water will not burn through. Among the many uses to which the bamboo may be put, that is one which I never heard of before nor seen since. After a slight breakfast, we commenced our journey homeward; but before getting out of the forest, M. Lomonosof, little accustomed to a hunter's life, became so exhausted from fatigue, that it was with difficulty he reached the place where horses had been ordered to be sent to await our return.

The animals which inhabit the vast forests of the Organ Mountains are, perhaps, no less various than the forms of the vegetable creation. Formerly the Ounce, or Jaguar (*Felis Onça*), used to be common, but now it is only occasionally that its roar is heard at night, or that cattle or sheep suffer from its depredations. The black variety, to which the Brazilians give the name of Tigre, is still more rare. The woods, however, abound with a very pretty species of wild cat (*Felis pardalis*). Monkeys are very numerous. In the morning the forests resound with the unearthly howling of the Barbado (*Mycetes barbatus*), which is as large as an ordinary dog, they live in bands of many together. There are several others quite as large,

but they are seldom to be seen. The grey Marmoset, which is so common in the forests of the northern provinces, is not to be met with here, but another, and perhaps a still more beautiful species is occasionally found. It is the *Jaccus auritus*. It is easily distinguished from all the other species by its nearly uniform dark colour, and the pencils of long white hairs which come out from its ears. The Sloth (*Acheus Ai*) is also occasionally found feeding on the leaves of the *Cecropia peltata*, which form his favourite food. One which I had for some time in captivity, was of a timid and fretful disposition. Like most other animals in which the brain is small in proportion to the development of the nervous system, it is very tenacious of life. Although more tardy in its movements than most quadrupeds of its size, it passes with considerable rapidity from branch to branch, from which in its progress it always hangs by the legs and feet. It owes much to Waterton, for being the first to remove the stigma which Buffon and others put upon its character. In the river which flows through the valley, the Brazilian Otter (*Lutra Brasiliensis*), and the Capybara (*Hydrochærus capybara*), are still occasionally to be met with. A pretty little deer (*Cervus nemorivagus*) frequently attracts the sportsman to the woods, as do also the two species of Pecari (*Dicotyles labiatus* and *torquatus*), which are so common all over the intertropical parts of South America. A kind of Opossum (*Didelphis Azaræ*) is as much the pest of the fowl-house as the fox is in Europe. It is very tenacious of life, getting up and running away when every bone in its body appears to be broken by the blows which have been inflicted on it. In the woods an

Armadillo (*Tatusia peba*) is not uncommon, the stewed flesh of which makes excellent food; and in the forests a prehensile-tailed kind of Porcupine (*Sphigurus spinosus*) is also often met with; they both burrow in the ground. The great Ant-bear (*Myrmecophaga tamandua*) is rarely, though occasionally, to be met with. Along with the monkeys, a little brown squirrel is often to be seen sporting among the branches of the trees.

Besides the numerous fly-catchers and other small birds, the wild pigeons, the flocks of parroquets and parrots, the hawks, owls, and the various species of Toucans, remarkable for their brilliant colours, and the great size of their bills, there are several large birds which are much sought after by the sportsman. These are the Jacú, Jacutinga, Jacubemba, Jacuassú, all gallinaceous birds belonging to the genus *Penelope*; two species of Quail, the Macúcu (*Tinamus macaco*), and the Nhambú (*Pezus niamba*); and, lastly, a Partridge (*Perdix Guianensis*), the Capoeira of the Brazilians. Of reptiles there are numerous snakes, many of which are beautifully coloured, a vast variety of lizards, and innumerable hordes of frogs and toads of all sizes, from the small tree kind not more than an inch long, to those marsh ones which are nearly large enough to fill a hat. Till one gets accustomed to the sounds which they produce, particularly previous to rain, they are almost deafening. During the day the air is full of beautiful butterflies of all colours, now flying from flower to flower, and now alighting on the moist sandy banks of pools and small streams in countless numbers. The large nests of wasps hang from the boughs of the trees, and smaller ones are often hidden among

the leaves and small branches of shrubs, the inhabitants of which, when disturbed, rush out and inflict summary punishment on the unhappy transgressor. In open places the leaves and flowers of bushes, and other plants, abound with Diamond and other beetles; while at night the air is lighted up with fire-flies of various sizes, which, from their brilliancy, give the idea that part of the stars have fallen from the firmament, and are floating about without a resting place.

While I resided at Mr. March's I frequently paid a visit to a Brazilian, Joaquim Paulo by name, who has a small estate about ten miles distant. My first visit was made along with Mr. Heath, and as we arrived shortly before dinner, we were invited to partake of that meal. This I was not displeased at, as it gave me an opportunity of witnessing the internal economy of a Brazilian country house, never having been in one before. The dinner was substantial and clean, but every dish was, according to the custom of the country, highly seasoned with garlick. The table was covered with a clean cloth, on one end of which was laid a heap of ground cassava root (*Farinha de Mandiocca*), and on the other a heap of ground Indian corn (*Farinha de Milho*). On one of these heaps was placed a large dish of boiled black French beans (*Feijoens*), with a large piece of fat pork (*Toucinho*) in the midst of them; while on the other was laid a dish of stewed fowl. We had also roast pork and blood sausages. From these dishes and heaps every one helped himself. As a vegetable we had a dish of cabbage-palm (*Euterpe edulis*), which is very tender and most delicious, tasting not unlike asparagus. During dinner we were each furnished

with a cup of Lisbon wine; and after it we had various kinds of sweatmeats. Besides ourselves, there were only our host and two of his sons. Indeed, his wife and daughters I did not see till I had been several times at the house. The two girls were rather pretty, but they could neither read nor write. The father would not allow them to learn either, from fear that they would take to the reading of novels, and the writing of love letters. He was himself a most inveterate huntsman, being almost always in the woods in pursuit of game. He was a capital shot, and had killed more tapirs with his own hand than any one in the vicinity.

I also visited occasionally a coffee plantation called Constantia, about fifteen miles distant from Mr. March's, belonging to M. De Luze, a Swiss, who had been many years in the country. It is situated in a flat valley surrounded by sloping hills, and is one of the most lovely spots I have ever seen. In the neighbourhood of it there are two other coffee plantations belonging to Germans, but they have all ascertained that the elevation is too great for the successful cultivation of coffee. Since then M. De Luze has sold his estate to Mr. March, and bought a larger one, in a fine coffee country on the banks of the Rio Parahiba. In the latitude of Rio, coffee does not succeed at a much greater elevation than 2000 feet. At Mr. March's the bush grows well, but it never ripens its fruit properly.

The most distant journey I made, was to an estate about twenty miles to the north of Mr. March's Fazenda. About the middle of April, Mr. Heath received a note from the lady to whom it belongs, Dona Rita Thereza da

Roza, asking him as a great favour to ride over and take me along with him to see her little daughter, who a few days before had been attacked with apoplexy and paralysis. On the following day it was our intention to have gone, but heavy rains, which came on and flooded the rivers, prevented us from starting till the succeeding day. Mr. March's house being at the south end of his estate, we had to pass along the whole length of it, a distance of about eight miles. After leaving it our road led over a very high hill; it was steep, and, the soil being a kind of red clay, was so slippery in consequence of the heavy rains which had lately fallen, that our mules had considerable difficulty in getting up. The declivity on the other side was nearly as bad. From this place the road passed for the most part through large fields of Indian corn, which was then nearly ripe for collecting, and several small patches of rice in the moist flat places. When we arrived at the house of the lady, we learned that the daughter died the evening before. We were shown the body, which had been put into a coffin, and placed in a neat little chapel belonging to the estate, and in which it was to be buried. The interment was to take place on the arrival of the Padre, who had to be brought from a distance of forty-eight miles, and was hourly expected. The child was only eight years of age, but had been long unwell. We had to remain to dinner, and, as many relations and neighbours were present, the party was a large one. Until dinner was ready, the eldest daughter, a rather plain girl, was amusing herself by swinging to and fro in a hammock, which was slung in one corner of the dining-room. As an instance of the early age

at which women marry in Brazil, I may mention that we were informed by the lady herself, that she was married at ten years of age, and was a mother before she had completed her eleventh year. She was then forty-five years old and had had no less than twenty-five births, ten of which were miscarriages. We were received with much kindness, and she expressed herself very grateful for my visit.

As the Organ Mountains rise to an elevation of about four thousand feet above Mr. March's house, I had long been desirous to spend a few days among the high peaks, for the purpose of making collections of their vegetable productions. The only botanists who had visited Mr. March's estate before me were Langsdorff, the celebrated voyager, and at that time Consul General for Russia in Brazil, Burchell the African traveller, and a German of the name of Lhotsky. The former explored the vegetation in the neighbourhood of the Fazenda, during a stay of a few weeks, about twelve or thirteen years before my visit; Mr. Burchell remained six weeks, nine or ten years before; and Lhotsky, two or three weeks only, about five years later. None of them botanized higher than the level of Mr. March's house, and the knowledge of this fact made me the more anxious to explore a field which promised so much novelty. I had fixed on the early part of April for going up, but the whole of that month was so wet that I was prevented at that time from putting my design into execution. May, however, having set in fine, I started on the morning of the 6th, accompanied by four negroes. One of them, "Pai Felipe," a creole upwards of sixty years of age, was to act as guide. This old fellow

was one of the most active, not only of blacks, but of any individual of his years I have ever seen. From his infancy he had been accustomed to the woods, and was one of the best hunters on the estate. The other three were to carry provisions, and to assist in taking home my collections. We entered the forest at about a mile to the north of Mr. March's house, and our road for that day was nearly due west. Two years before, an English merchant from Rio ascended, from mere curiosity, to within a few hundred feet of the summit, guided by the same old black who accompanied me. For the first few miles we were able to keep the road which he had made, but, from the rapid growth of the bamboos and underwood through which it had been cut, it was as difficult to force our way as if no path had ever been made. Our progress was but slow, it being necessary for one of the blacks to go on before in order to cut a pass. Some of the bamboos were of immense size; I measured several about six inches in diameter, and their height could not be less than eighty or a hundred feet. The internodes are generally filled with water, obviously secreted by the plant itself. Prince Maximilian, in his travels, speaks of this fluid as forming a most delicious beverage to hunters and others in the woods. I have frequently tasted it, but always found it so nauseous that the most urgent thirst alone would compel me to drink it.

Near the entrance of the wood we passed a large species of *Copaifera*, the lower part of the stem of which had been pierced for the purpose of obtaining the balsam which those trees exude. For miles our route lay nearly parallel with a small river, along the banks of which grew

some very large trees, among them I observed a species of *Laurus*, and another of *Pleroma*, both in flower. The underwood consisted of a great variety of shrubby *Melastomaceæ*, *Myrtaceæ*, *Rubiaceæ*, and suffruticose species of *Begonia*. In other places elegant tree-ferns abounded, their stems often covered with little delicate species of the same tribe, or air-plants bearing beautiful flowers. Pretty herbaceous ferns and handsome-flowered *Begonias* were trodden down at every footstep. The stems of the large trees were covered with *Bromelias*, *Tillandsias*, *Orchideæ*, ferns, and a climbing species of *Begonia*. Occasionally a large plant of *Cactus truncatus* was to be seen hanging from rocks or from the stem of some large tree, covered with hundreds of beautiful pink blossoms. In crossing over a hill about five hundred feet high, which stands in the valley we were now passing through, I found the top of it literally covered with various kinds of Orchidaceous plants, but with the exception of the beautiful little *Sophronites grandiflora*, which was then in flower, all had been previously met with at a lower elevation. It was here likewise that I first met with *Luxemburgia ciliosa*, a fine shrub producing large corymbs of lemon-coloured flowers, and belonging to the violet tribe. On this hill I likewise observed two kinds of bamboo, different from the large kinds in the woods below. One of them had the internodes considerably shorter in proportion to the size of the plant, and was altogether much smaller. The other species was still less, its stem not being more than half an inch in diameter, but continuing of that thickness to a height of fifteen or twenty feet. The getting through these was the most difficult part of our day's journey.

At four o'clock, P.M., we reached a place by the side of a small stream, where I determined to remain for the night; and, while the blacks were occupied in cutting wood for a fire and in preparing dinner, I took a walk up the course of the little stream. As I estimated this spot to be at an elevation of about 4,500 feet, I naturally expected a vegetation different from that in the valley below. The first plant that attracted my attention was what I imagined to be a fine individual of *Cereus truncatus*, in full flower, hanging from the under side of the trunk of a large tree that was bent over the stream, but on getting possession of it, it proved to be a new, and, perhaps, a still more beautiful species. I have named it *Cereus Russellianus*, in honour of His Grace the late Duke of Bedford, one of the most liberal supporters of my mission to Brazil; it has since been introduced to the hot-houses of England. A little way further up the stream, by the side of a small waterfall, and on a slanting bank near it, grew great abundance of a fine dark red-flowered *Amaryllis*. This spot is one of the most charming I have ever seen. The bed of the stream is about ten feet broad, but it is only during heavy rains that the water covers this space; at this time the stream was little more than perceptible. The water falls over three successive shelves of granite, each about eight feet high, the faces of which are covered with mosses. Along the stream at the bottom of the fall there are several middle-sized trees, the branches of which are festooned with the long branches of a *Fuchsia*, loaded with splendid crimson flowers. By the side of the fall there are several bushes of a large flowered *Pleroma*, and, along with them, a few of a

red-blossomed *Esterhazya*, and a broad thick-leaved species of *Clusia* (*C. fragrans*, Gard.), loading the atmosphere with a delightful odour arising from its large white blossoms; beneath these grow the *Amaryllis*, an *Eryngium*, several *Tillandsias* and many *Ferns*. Having gained the upper part of the fall, I found a space, extending to a considerable distance on each side and for some way up the mountain, destitute of trees—nothing but bare portions of rock, with occasional masses of low shrubs and herbaceous plants. Among the *Orchideæ*, the beautiful *Zygopetalon Mackaii*, and the odoriferous *Maxillaria picta*, were not the least common. Darkness now beginning to set in, I returned to the encampment, where I found a large fire lighted; the evening was so fine that I considered the erection of a hut unnecessary, and lay down about eight, P.M., on a few palm leaves by the fire, with my Poncho round me, to pass the night.

When I arose next morning at day-break, I found the thermometer at 46°. While breakfast was preparing I again went out to botanize, but added little more than a few Ferns to my collection of the previous evening. Our journey to the place where we slept was of very gradual ascent; we had now to commence the *ascent proper* of the peaks. Leaving behind all that was not actually necessary to be taken along with us, we began our journey by passing the little waterfall, and walking up the bed of the stream, along the gently sloping face of a granite rock; the ascent of several parts of this was rather difficult, having to crawl up on our hands and knees; after half an hour's hard work we reached a comparatively flat wooded spot. On the steep part I collected,

in moist places, an *Eriocaulon*, a small *Sun-Dew*, and a new genus belonging to the *Gentian* tribe; among these grew also the curious *Burmannia bicolor*. In passing through the wood above mentioned, I saw plenty of my new *Cactus* growing on the stems of the larger trees, whilst the rocks were covered with *Gesnerias*, and different kinds of *Orchidaceous* plants. Emerging from the wood we encountered another steep rocky place, almost entirely covered with a large pine-apple-like *Tillandsia*, above which rose a few plants of a fine large scarlet-flowered shrubby *Salvia* (*S. Benthamiana*, Gardn.), and a pale blossomed *Virgularia*; on a nearly bare portion of the rock, grew several patches of a large herbaceous plant, belonging to the tribe of the *Gentians*; it grows from a foot to two feet high, with thick succulent glaucous leaves, the upper ones connate, and from out of which proceed about half a dozen pedicels, each bearing a single large flower, the calyx of which is much inflated and tinged with purple; it is the *Prepusa connata*, Gardn. The only previously known species was found by Martius, on a large mountain range between the Diamond country and Bahia; a third was afterwards discovered on the very summit of the Organ Mountains. Passing this place we again entered a wooded tract, where we found many Tapir paths, as we had also done the day previous in the woods through which we passed, which rendered our progress much quicker than it otherwise would have been, as the branches above only require to be cut away to make a good road. Judging from the abundance of the tracts which we here met with, the Tapir must be a very common animal in this remote and solitary part of

the mountains; here they are as yet out of the reach of the hunter, who commits great havock among those which inhabit the lower woods, and there is also abundance of herbage to supply them with food. In passing through this wood, one of the blacks shot a *Jacutinga* (*Penelope Jacutinga*, Spix), and I collected specimens of a few Orchideous plants, and a large yellow-flowered *Senecio*.

Leaving the wood we came upon a slanting *Sphagnum* bog, in which grew some very alpine-looking shrubs; these consisted chiefly of a Proteaceous-like *Baccharis*, a *Vaccinium*, an *Andromeda*, the *Lavoisiera imbricata*, remarkable for its large flowers and small leaves, and a *Pleroma*; among the moss, an *Eriocaulon*, and a handsome *Utricularia*, with large cordate leaves and purple flowers, grew in the greatest profusion. Judging from the top of the mountain, we were now at an elevation of nearly 6,000 feet. Leaving it, we commenced a very steep ascent covered principally with low shrubs; we continued our way for about an hour through this stunted vegetation, making but slow progress, although we were much facilitated by having the path of the Tapir to crawl up. By following this track we reached a point from which a beautiful prospect of the low country is obtained, particularly to the eastward, where, as far as the eye could reach, it was one mass of conical shaped hills, only one ridge rising to any considerable height above the rest; the point we had attained was the summit of one of the many peaks which form the upper range of the Organ Mountains. At about a quarter of a mile distant stood, what I then believed to be the highest peak, and certainly not more than three or four hundred feet above

us; but between the two peaks lay a deep densely-wooded ravine. It being now past two o'clock in the afternoon, it was too late to think of ascending it that day, so I determined to remain where we were for the night, and attempt it next day, but the blacks refused to do so, on account of no water being nearer than a little above where we had slept the previous night; as I could not force them to remain, I was, much against my will, obliged to abandon all idea of reaching the summit at this time. Not having a barometer with me, I endeavoured to ascertain the boiling point of water, but in doing so, broke the tube of the thermometer. Four years later, during a visit of six days to the peaks, I was more fortunate; of that excursion an account will be found in a subsequent part of the present work. The summit of the peak on which we now were, was quite a little flower garden; a pretty *Fuchsia*, in full flower, was trailing over the bare rocks, in their clefts grew a handsome *Amaryllis*, and on all sides numerous flowering shrubs. The coolness of the air and the stillness were quite refreshing; not a sound was to be heard; and the only animals to be seen were a few small birds, so tame that they allowed us to come quite close to them. After partaking of a slight repast we commenced our downward journey, and reached our encampment just as night was setting in. Next day, following the route by which we had come, we arrived at the Fazenda about four o'clock in the afternoon, groaning under our loads.

About a week after our return, I made another visit to the place where we had formerly encamped; my object was to obtain additional specimens of the many new

plants which I had found in that neighbourhood. On this occasion I was again accompanied by "Pai Felipe" and the other three blacks; we left the Fazenda at eight o'clock in the morning, and reached our sleeping place about three in the afternoon. On the following day I occupied myself with making excursions in various directions; during these walks I collected great plenty of *Cereus Russellianus*. This plant offers a good example of nearly allied species representing each other in different regions of the same mountain; during the many times that I passed through the woods, on my journeys to and from the peaks, I always found *Cereus truncatus* confined to the dense virgin forests below the elevation of 4,500 feet, while from this point to nearly the summit of the mountains, *Cereus Russellianus* alone was seen, enjoying a more open and a cooler region. The day was one of the most delightful I ever remember to have witnessed, quite like one of the finest days of an English summer; the sky was clear and unclouded, and the atmosphere being free from that haze which often, in the finest weather, renders the view of distant objects indistinct, allowed us to obtain a perfect and well-defined prospect of the high mountains far to the eastward. Having got all my specimens put into paper, I lay down to sleep shortly after seven o'clock, little dreaming what a miserable night I was to spend. I had just fallen asleep by the fire, on my bed of palm leaves, when I was suddenly aroused from my slumber by a deluge of rain which was pouring down; one of those sudden and heavy thunder-storms, which are never witnessed in temperate climes, was passing over us. Had we been in an open place, we

might have seen it approaching and been able to form some kind of shelter before it came on, but the tops of the trees by which we were covered prevented this. I never was out in such weather; the flashing of the lightning, the rolling of the thunder, which was breaking immediately over us, the roaring of the wind among the trees, and the falling of rotten branches, all combined to render the scene terrific. In a few minutes our large fire was extinguished, and the place swimming with water; although I was covered with a thick Poncho, it was but a poor protection for such a night. In half an hour the small stream beside us, which during the day had only a few inches of water, came roaring down like a cataract. To add to our misery, the night was pitch dark, so that we could not see to remedy our situation. What a night I spent may be imagined, when I mention that I sat from about half past seven in the evening till nearly three o'clock in the morning, under an incessant deluge of rain; a more perfect picture of patience, I flatter myself, could not be witnessed. About three it began to abate, and being in a shivering condition from the cold and wet, we made several attempts to kindle a fire, but without success: everything was too wet to burn, and we were therefore obliged to content ourselves without one. By seating myself at the root of a tree, and leaning my back against it, I managed, at four different times, to obtain about an hour's sleep, but constantly awoke cold and shivering. Never was I so glad as when the first rays of day-light were seen streaming through the trees; and, as soon as we could see, we lost no time in preparing to return home. Shortly after we

did start it began again to rain, and continued till we reached the Fazenda, at two o'clock in the afternoon.

During the whole of my six month's residence on the Mountains, the cottages were generally crowded with visitors. There was, consequently, much gaiety, it being seldom that an evening party was not held at one or other of them, where nearly the whole of the residents assembled. Then there were frequent Pic-nic parties to different distant parts of the estate, and, when the weather permitted, delightful evening rides. In this manner many of my leisure hours, which otherwise must have passed away very dully, were most agreeably spent. Indeed, I still look back upon those few months as one of the most happy periods of my life, for independantly of those pleasant pastimes, I was daily occupied with a favourite pursuit, and that, too, in a field which was all but new.

CHAPTER III.

BAHIA AND PERNAMBUCO.

Departure from Rio de Janeiro—Arrival at Bahia—Description of this City—Voyage to Pernambuco—Jangadas—Description of the City and Environs of Pernambuco—The Jesuits—The Peasantry—Town of Olinda—Its Colleges and Botanic Garden—Visit to the Village of Monteiro—The German Colony of Catuca—The Island of Itamarica—Pilar—Saltworks of Jaguaripe—Prevalent Diseases in the Island—Its Fisheries—Peculiar Mode of Capture.

On the tenth of June, 1837, I arrived in Rio from the Organ Mountains, and, during the remainder of that month, July, August, and the early part of September, occupied myself in arranging and packing the collections brought down with me, and in making a few excursions in the neighbourhood. Having at length despatched everything for England, I took a passage for Pernambuco in H.M. Packet 'Opossum,' being now desirous to explore the northern provinces. We sailed from Rio on the fifteenth of September, and, after a passage of thirteen days, during which we had much bad weather and contrary winds, reached Bahia. At three o'clock, P.M., on the twenty-eighth, we came to an anchor in the bay opposite the city, and about a mile distant from it. As the land along this part of the coast rises only a few

hundred feet above the level of the sea, it is not seen at so great a distance as the high lands are at Rio. In sailing up the bay, we kept pretty close to the shore, and I could not help remarking the great luxuriance of the vegetation. Cocoa-nut trees and other large palms are very abundant, and the mango trees are both larger and more numerous than those about Rio. The city of Bahia, when first seen, has a very imposing appearance, the greater part of it being built on the face of a hill, which rises about 500 feet above the sea, and the houses, most of which are of several stories, are all white-washed externally. The effect is much heightened by the great number of banana, orange, and cocoa-nut trees which are intermingled with the houses, the dark green leaves contrasting well with the white, and affording a pleasant relief to the eye. The Packet being allowed to remain here forty-eight hours, for the preparation of the mails for Pernambuco and England, I went on shore shortly after our arrival, with some of the other passengers.

The city of Bahia, sometimes called San Salvador, is situated in the bay which is known by the name of "Todos os Santos." It is divided into an upper and a lower town; the lower is built on the narrow slip of land that lies between the sea and the rising ground on which the upper town stands. It consists chiefly of one long street, which is both narrow, badly paved, and dirty. The houses are mostly high, and those adjoining the shore project considerably into the sea. After viewing this commercial portion of the city, we proceeded to the upper town. As the streets which form the communication between them are too perpendicular to allow the use

of carriages, those who do not choose to walk are carried in a kind of covered chair slung on a pole, which is borne on the shoulders of two negroes. These "Cadeiras" are commonly used both by ladies and gentlemen, and can always be hired in the streets. We, however, preferred walking, and after passing through some of the principal streets, and visiting the inside of one of the large churches, we strayed out a little way into the country, delighted with the rich and pleasing aspect which it afforded. In the evening we visited the reading room of the Literary Society, where we found a few of the newspapers, and many of the literary and scientific journals, of France, England, and America. After a short stay here, we went to a large hotel opposite the theatre, where we took up our quarters for the night; but, what with the uncomfortable beds, the rattling of dice, and the still louder clink of dollars, in an apartment immediately below us, which continued till nearly four o'clock in the morning, our night's rest was not of the most refreshing nature.

On the forenoon of the following day, we visited a convent towards the west end of the city, where the nuns make artificial flowers for sale, from the feathers of birds. We were shown into a small room, separated from the body of the building by a thick wall, through which the traffic takes place by means of a large grated window. We were soon surrounded by wreaths of all kinds and colours suited for head dresses; these were either sent round to us in baskets, or pushed, one by one, through the grating on a stick. It is the duty of each nun in her turn to officiate as sales-woman, whenever purchasers

visit the convent, the flowers being brought to her by the servants of the establishment, who are either black or brown girls; the one upon whom this duty fell at the period of our visit was neither young nor beautiful, and destroyed all my romantic notions regarding nuns and nunneries. Several purchases were made by my companions with a view of taking them as presents to England.

After leaving the convent, I hired a boat in order to proceed a few miles further up the bay, and landed on a peninsula called Bomfim, across which I walked, accompanied by one of the two blacks belonging to the boat, the distance being rather less than two miles. After leaving the shore, on which grew *Sophora tomentosa*, and *Eugenia Michelii*, two shrubs common all along the coast of Brazil, I passed through a marsh containing several species of plants that were new to me. Beyond this, the road passed through a dry sandy hollow, in which not a breath of air was to be felt, and the rays of the mid-day sun, reflected from the white sand, had so heated the atmosphere, that I was almost suffocated before I could reach a little eminence at the other end of it. Here, also, I enriched my collections, and still further on I found the thistle-like *Amphercphis aristata* growing commonly by the road-sides; and some large pools in a marsh, under the shade of a thicket of giant palms, were quite covered over with *Pistia stratiotes*, a plant nearly related to the Duck-weeds of England, but of a much larger size: other pools were gay with the yellow flowers of *Limnanthemum Humboldtianum*. After reaching the shore I walked along it for a little way, and then returned

to the boat by a different route. In passing through a swampy place at the foot of a hill, on which a large church stands, I found a few specimens of the beautiful *Angelonia hirsuta*, with its long spikes of large blue flowers. I afterwards met with several new species of this fine genus, some of which, raised from seeds sent home by me, are now common in hot-houses. During this walk I observed some very large mango trees, many of them twice the size of those growing about Rio. These trees have a handsome appearance when seen at a distance, surrounding the numerous white-washed country houses; the trunk, which is often of great thickness, seldom rises above eight or ten feet above the ground, when it branches into many widely-spreading ramifications, which rise to a great height, and are so densely covered with leaves as to be impenetrable to the burning rays of the sun, thus forming a most agreeable and luxuriant shade. At three o'clock we returned to the boat, well loaded with my day's spoil. In the evening I dined with a gentleman to whom I brought letters from Rio, and there met a young Scotchman, who invited me to sleep at his house. Next morning he accompanied me into the country a short way; we started a little before six o'clock, walked to the distance of about six miles, and reached the city again by a different route before ten. The country inland, so far as I could observe, forms a sort of elevated table-land, of a gently undulating nature, and the appearance of the vegetation bespeaks great richness of soil. Besides great plenty of large mango trees, I observed many Jacks (*Artocarpus integrifolius*) of almost equal size, the trunks and large branches of which

were loaded with their large yellow-coloured fruit; this tree is very much cultivated in this part of Brazil, and, I was told, that, a few years before my visit, during a scarcity of provisions in the province, its fruit, which is yielded in the greatest abundance, was the means of preventing a famine among the black population. On our return to the city, we passed a small village close by the sea, the inhabitants of which, principally blacks, are mostly occupied in whale fishing, the sperm whale being rather plentiful on this part of the coast. On entering the bay, we observed a number of whale boats going out, manned by negroes. On visiting Bahia, one circumstance which forcibly strikes the attention of a stranger, even coming from the other provinces of Brazil, is the appearance of the blacks met with in the streets; they are the finest to be seen in the country, both men and women being tall and well-formed, and generally intelligent, some of them even, as I have elsewhere observed, being tolerable Arabic scholars; they have nearly all been imported from the Gold coast, and, not only from their greater physical strength and intelligence, but from being united among themselves, they are more inclined to insurrectionary movements, than the mixed races in the other provinces: only a fortnight after I left Bahia a serious insurrection took place, headed, indeed, by some white Brazilians, but supported by most of the black population; they kept possession of the city for many months, nor were they fully dispossessed of it till after the destruction of much life and property.

On the thirty-first, at three o'clock in the afternoon, we set sail for Pernambuco. On the second night after

we left, while I was walking the quarter deck with the captain, the watch forward reported a sail close on the weather-bow; the crew were immediately piped to quarters, and, in less than five minutes, were all on deck ready for action. Shortly afterwards we saw the vessel pass us at some distance and disappear. As these Packets generally carry home a large amount of specie to England, it was not without reason that the captain prepared himself for what might happen, especially on a coast where suspicious craft are not unfrequently hovering about. There was something exciting in this little incident, and it afforded matter for conversation on the following day. After a passage of nine days, land was descried early in the morning from the mast head, and in the course of a few hours we could see it from the deck, rising above the horizon like a long black cloud. On nearing the coast it presented a very flat and barren-like aspect, forming a great and unpromising contrast to the magnificent entry to the bay of Rio de Janeiro. The town being built nearly on a level with the sea, we could only obtain a view of that portion of it which immediately skirts the shore, the houses and the cocoa-nut trees appearing above the horizon. No part of the coast within many leagues of Pernambuco, rises to any height, except that whereon the old town, called Olinda, stands, and which is situated about three miles north of Recife, the name of the sea-port. While standing in for the harbour, we passed a number of fishing boats of a very peculiar construction; they are called Jangadas, and formed of four, or more, logs of wood lashed together, having a mast and very large sail, a fixed stool-like seat,

but no bulwarks, so that the waves constantly break over them; they sail with remarkable speed, and often venture to a great distance from land. A few of the same craft may be seen at Bahia, but none at Rio. The light wood of which they are formed is obtained from a species of *Apeiba*, a genus allied to our own Linden-tree. We anchored in the outer roads about twelve o'clock, and, after the lapse of an hour and a half, a pilot came on board, and conducted us into the harbour, which is quite a natural one, being formed by a reef that runs along the coast, at a little distance from the shore; the entrance is through a breach, upon the south side of which is a light-house and a small fort. A very heavy swell runs outside the reef and breaks over it, but there is always calm water within; and at full tide it is sufficiently deep to float the largest merchant vessels that visit the port.

The town of Pernambuco has but few recommendations to those who are not engaged in business. The houses are higher than those at Rio, the streets for the most part still more narrow, and certainly quite as dirty. In nearly all the towns and cities of Brazil, rain is the only scavenger, and by it the streets are kept tolerably clean in such of them as are built on declivities, but this, unfortunately, is not the case with Pernambuco; in the wet season, the streets are full of mud and water, and in the dry, the mud is converted into clouds of dust. It has always appeared extraordinary to me that epidemic diseases do not prevail to a much greater extent than they do under such circumstances. The town consists of three great divisions: that in which the principal trade is carried on, is situated on a narrow neck of land, which

runs down between the sea and a river from Olinda, and is called Recife; another, principally occupied with shops, and containing the palace of the President, is built on an island, and is known by the name of St. Antonio; the third, called Boa Vista, consisting principally of one long street, is constructed on the main-land, and is by far the finest part of the whole. These are all connected by means of two wooden bridges. As Pernambuco is situated on the most eastern part of the American continent, it is fully exposed to the influence of the trade winds all the year round, and hence enjoys a cool climate; it is considered more healthy than either Rio or Bahia. Except two or three churches it contains but few public buildings, and, at the period of my visit, it had not a single hotel of any description. The 'Palace' in which the affairs of the Provincial government are now carried on, was in former times the Jesuits' College, and stands on the bank of the river; it is a large building of gloomy appearance, with walls of enormous thickness. When it was erected by these enterprising and charitable men, they little dreamed that their career was to terminate at so early a period as it did. It is handed down from father to son, particularly among the middle and lower classes of Brazil, that the destruction of Jesuitical power was a severe loss to the well-being of the country. There are of course but few alive now who have personal recollection of the excellent men who formed the 'Company of Jesus,' but the memory of them will long remain; I have always heard them spoken of with respect and with regret. What different men they must have been from the degraded race who now undertake the spiritual wel-

fare of this nation! It is a hard thing to say, but I do it not without well considering the nature of the assertion, that the present clergy of Brazil are more debased and immoral than any other class of men. However much the Jesuits were slandered and persecuted from the jealousy of those who envied the respect in which they were held by their flocks, and the confidence which they reposed in them, enough of the good still remains to shame those who have succeeded them. More than one nation of Indians in Brazil, which, in the time of the Jesuits, had renounced their savage life and become Christians, have, since their suppression, returned to the condition from which, at so much risk, and with so much labour, they had been redeemed. Whatever were the motives of the Jesuits, they are judged of in Brazil not by them, but by their good works.

The inhabitants of the town of Pernambuco resemble very much those of Rio, but there is a great difference in the appearance of the country people, which here, as elsewhere, are easily distinguished from the citizens. Those seen in the streets of Rio de Janeiro are a tall handsome race of men, mostly from the mining districts, or the more southerly province of San Paulo; their dress consists of a linen jacket and trowsers, generally of a blue colour, brown leather boots, which are firmly tied round the leg a little above the knee, and a very high-crowned broad-brimmed white straw hat. Those, on the contrary, who frequent the city of Pernambuco, are a more swarthy and more diminutive race, but still far superior in appearance to the puny citizens. There are two classes of them, the Matúto and the Sertanejo, the Matútos inhabit the

low flat country, which extends from the coast up to the high land of the interior, called the Sertão, or desert, which gives name to, and is inhabited by, the Sertanejos. The dress of both for the most part, but of the latter in particular, consists of a low round-crowned broad-brimmed hat, jacket, and trowsers, made of a thin yellowish brown-coloured leather, that manufactured from the skin of the different kinds of deer being preferred; in place of a waistcoat they very frequently wear a triangular piece of the same kind of leather, fastened round the neck and middle by cords of the same material. The boots in use in the province of Rio are unknown here, and either shoes or slippers, also of brown leather, are worn instead. The Matúto generally dispenses with the leather trowsers and shoes, using in place of them a pair of wide cotton drawers, which reach only a little below the knee, the legs remaining bare. Cotton and hides are the principal articles brought from the interior, and horses are the only beasts of burden, mules being as rarely used for that purpose here, as horses are in the southern provinces. Each horse carries two large bales of cotton as well as the driver, who places himself between them, stretching his legs forward on a level with his seat.

Upon landing in Pernambuco, I found Dr. Loudon, a Scotch physician resident in that city, awaiting my arrival, who kindly invited me to remain with him during my stay; and as he had then been sixteen years in the place, and was acquainted with most of the influential people both foreign and Brazilian, I derived much advantage from his friendship, more particularly so, as he was very partial to the pursuit of natural history. Shortly after

my arrival I delivered the letters of recommendation given me by Mr. Hamilton, the British Minister at the court of Rio, to Mr. Watts, the Consul, who obligingly offered to introduce me to the President of the province, Senhor Vicente Thomaz Pires de Figueredo Comargo. The permission to wait upon his Excellency having been given a few days afterwards, I accompanied Mr. Watts to the palace, together with Dr. Loudon, who was a personal friend of the President. He received me with great kindness, and when the object of my visit to the country was explained to him, he promised to afford all the assistance in his power, and, in the meantime, gave me a letter to Dr. Serpa, the Professor of Botany and Curator of the Botanic Garden at Olinda.

I was accompanied in my visit to Olinda by Mr. Nash, a young Englishman, to whom I was indebted for many acts of kindness during my residence at Pernambuco. There are three routes to Olinda from Recife; one along the shore, which is seldom taken on account of the loose sandy nature of the soil, and the complete exposure of the traveller to the sun. Another is by canoes, up the stream before mentioned by which the surplus water from a large lake behind Olinda is discharged into the sea; this stream runs parallel with the shore, from which it is separated by a high sand-bank, and is fringed on each side by a strip of mangroves, the mud in which they grow emitting at low tide a very disagreeable effluvium, and abounding in crabs of various sizes and colours, while clouds of mosquitos always hover around and harbour among the branches. The third route, which we pursued, runs parallel with the river, at a considerable

distance inland. This road is quite level, and at both ends are seen several fine country houses, though much of it passes through uncultivated, and often marshy land. Occasionally it is enclosed by Mimosa hedges, in which is seen a slender climbing kind of Jasmine (*Jasminum Bahiense*, DC.), whose white flowers at the early hour we passed were perfuming the air with their delightful fragrance. The roadside was gay with the large pale yellow flowers of *Turnera trioniflora*, and the delicate pink heads of a sensitive plant. Several different kinds of this latter plant grow very abundantly all over the northern parts of Brazil. Shelley has truly said, that,

> "The sensitive plant has no bright flower,
> Radiance and odour are not its dower,—

yet there are few in the whole range of the vegetable kingdom, which are so much an object of curiosity to all observers, or of so much interest to the physiologist. On approaching Olinda, I was delighted to find the surface of the lake—which abounds in alligators—covered with thousands of the splendid large white blossoms and broad floating leaves of a water-lily (*Nymphæa ampla*, DC.), and intermingled with them, the yellow flowers of *Limnocharis Commersonii*, and a large *Utricularia*.

The Botanic Garden is situated in a hollow, behind the town of Olinda, and, though of considerable size, has only a portion of it under cultivation; the residence of the Professor stands nearly in the centre. We found Dr. Serpa in his study, a rather large apartment, which he uses also as a lecture-room; he appeared to be about sixty years of age, and we were impressed with his agreeable manners and intelligence. Besides his other duties,

he had the principal medical practice in Olinda. A few French works on Botany, Natural History, Agriculture, and Medicine, composed the chief part of his limited library. It was here that I first saw the 'Flora Fluminensis,' a work published at the expense of the Brazilian government. The drawings from which the plates were executed, were prepared at Rio de Janeiro, about the end of the last century, under the direction of a Jesuit of the name of Vellozo. It cost about £70,000., and, to use the words of Dr. Von Martius, is "a strange publication, which may be held up as an example of an ill-advised literary undertaking, and on so great a scale that it ought never to have been commenced. Eleven huge volumes, with about fifteen hundred plates, constitute this bulky work, whose usefulness is, alas! not in proportion to the expense it occasioned.*" The Doctor accompanied us in a walk round the Garden, which I found to contain little worthy of notice; a few European medicinal plants, struggling for existence, and some large Indian trees, being its principal productions; among the latter, however, were fine specimens of the Mango, Tamarind, Cinnamon, and the Date-Palm. He had lately received from the interior, plants of a species of Ipecacuanha, the roots of which form an article of export from Pernambuco, and the living specimens which I obtained from him are now growing freely in the stoves of the Glasgow Botanic Garden. They appear different from the one figured and described by St. Hilaire, from the south of Brazil, and will, I suspect, prove to be a distinct, though nearly related species. Leaving the garden, we walked a little

* Vide Hooker's 'Journal of Botany,' vol. iv. p. 5.

way into the country, where I hoped to meet with something more interesting; and in this expectation I was not disappointed, as many new plants were added to my collections. On the dry bushy hills in this neighbourhood a wild fruit-tree grows very plentifully; it is the Mangaba of the Brazilians, and the *Hancornia speciosa* of botanists; it is a small tree belonging to the Natural Order *Apocyneæ*, the small leaves and drooping branches of which give it somewhat the resemblance of the weeping birch. The fruit is about the size of a large plum, of a yellow colour, but streaked a little with red on one side, and the flavour is most delicious.

In the afternoon we returned to Olinda, to dine with another gentleman to whom I also carried letters, Senhor da Cunha. He had been educated in England, and was an intelligent man. After dinner we walked out to see the town, which is very pleasantly situated on an eminence not far from the sea. It is a place of considerable size, and in the olden time must have been a stirring one, particularly as regards the clergy, judging from the number of churches, convents, monasteries, &c. It has now, however, a desolate and deserted appearance, many fine houses being untenanted and falling to decay, and the streets are grown over with grass and weeds. On the outskirts of the seaward side of the town, there are the ruins of a large monastery, which, we went to see on account of a hermit who had lived there upwards of seventeen years. We found it to be a very large building, consisting of a church in the centre, still in use, and two wings, containing the apartments formerly inhabited by the friars, which are fast running into decay, particularly

those in the south wing. The north wing is in much better repair, having a few good rooms, which are inhabited by some of the students attending a theological and medical school, established in Olinda. Along the corridors, and in some of the larger rooms, are still a few paintings, but in a state of much decay. While surveying this great fabric, we could not help thinking of the contrast it now offers to the times, not long gone by, when its walls re-echoed to the footsteps and prayers of the devotees of a religion, which was then in a much more flourishing state than it now is, over nearly the whole of the empire of Brazil.

It was among the ruins of the south wing that the hermit lived. We visited the room in which he was said to be generally found, but he was not there. We then passed through a small court nearly choked with rubbish, and entered a large dark room, partly filled with old bricks and lime. Upon the floor of this wretched apartment we found him lying, presenting a most miserable appearance. His only covering consisted of a piece of thin black cloth wrapped round his body, his head, arms, legs, and feet being bare. He appeared to be about sixty years of age, but his long grey hair and beard made him look older, perhaps, than he really was. He was moaning and otherwise seemed to be in great agony, and it was with some difficulty he told us that two days before, while walking across the floor of the room above, it gave way, and he was precipitated to the place where we found him extended, and from which he was unable to move. We tried to raise him, but the slightest movement gave him excruciating pain. As some of his bones

seemed to be broken, a young man who had accompanied us, went off immediately to procure assistance, and have him taken to the hospital. All the information I could obtain, relating to this unfortunate being, was that at one time, he had been an officer in the army, and was now doing penance for a murder he had committed in his youth. We also visited a convent the nuns belonging to which, prepare preserved fruits for sale. Unlike the one I visited at Bahia, we could only speak to, not see, those who were within. The fruit was put upon a shelf of a revolving kind of cupboard, and in this manner sent out to us; the money and empty plates were returned in the same way. Like all the preserves I have met with in the country, those we had here were spoiled with too much sugar.

For the first few days, my walks did not extend much beyond the suburbs of the town. The country being quite flat, the soil sandy, and the dry season having commenced, the herbaceous vegetation in the more exposed situations, was beginning to suffer for want of rain. For many miles round the town; the Cocoa-nut, and other large Palms, grow in the greatest profusion, mixed with fine trees of the Cashew-nut, then loaded with their curious and refreshing fruit of a yellow or reddish colour, and the Jack, the Bread-fruit, and the Orange. Much attention, I observed, is paid to the gardens attached to the houses near the town, many of them being tastefully laid out, and adorned with beautiful shrubs, partly Brazilian and partly of Indian origin. The Mimosa, and other hedges, as about Rio, are festooned with climbers, among which the Cow-itch plant (*Stizolobium urens*) is

the most abundant. There is also in many places a large species of Dodder (*Cuscuta*), which climbs over the hedges with its long yellow cord-like branches, and gives them a most singular appearance. The sea-coast yielded me many curious plants, particularly one part of it about eight miles to the southward of the town, where the soil for some distance inland, is very sandy, and covered with shrubs. There I found, in great plenty, a new kind of those curious mossy Cacti (*Melocactus depressus*, Hook.); it was but a small one, being only about four inches high, and eighteen in circumference.

About a fortnight after my arrival at Pernambuco, Dr. Loudon removed to his country house, situated on the banks of the Rio Capibaribe, about four miles west from Recife; and, as the country round it was chiefly uncultivated, this afforded more ample scope for my researches. The Rio Capibaribe, which empties itself into the harbour at the Recife, is of small size, and is navigable only for canoes to a distance of about ten miles from the town. The navigation for six miles, as far as Monteiro, is very pleasant, and the scenery is rendered more agreeable by the number of villas, surrounded by gardens, which are scattered along its banks. Many of these houses are only inhabited during the fine or dry season, when most of the wealthy citizens resort to them for the benefit of bathing in the river; for, in hot climates, fresh water is preferred, as bathing in salt water generally produces great irritation on the surface of the body, from the salt crystallizing there, unless washed off with fresh water. For the purpose of bathing, each house has a large shed projecting into the river, the tops

and sides of which are covered with cocoa-nut leaves. They are mostly rebuilt every year, as they are generally carried away by the floods in the rainy season.

About twenty miles to the westward of Pernambuco, there is a small German Colony called Catucá; it was established about eighteen years before, at a period when a German regiment, which had been in the service of the Brazilian government, was here disbanded, but it is now fast dwindling into decay. The few families residing there gained a livelihood by the manufacture of charcoal, which they carried to town for sale. Being desirous of spending a day or two at this place, I started early one morning in the beginning of November, accompanied by Mr. White, a young gentleman whom I had previously met on the Organ Mountains. We were guided by two Germans who were returning from Pernambuco, and their horses carried our luggage. Our route for about two hours was through a flat country, principally planted with Mandiocca, although a great part of it was still uncleared, only the large trees having been cut down: a few of those remaining rose high above their fellows of the wood, and agreeably diversified the landscape. After passing through this cultivated country, and ascending a slight eminence, we entered the virgin forest. Previously the road had been of a sandy nature, but now we found it to consist of hard red clay. Many of the trees were very lofty, although they do not commonly attain the stature of those in the Province of Rio, nor have their trunks the same circumference. Among the shrubs that grew below them, I observed a few *Melastomaceæ*, *Myrtaceæ* and *Rubiaceæ*. Here everything betokened a drier

atmosphere, and a more arid soil than at Rio. There were no *Ferns*, *Begonias*, *Pipers*, or *Orchidaceous* plants. On the stems and branches of the larger trees a few *Bromeliaceæ* and *Aroideæ* were alone to be seen. After riding for about an hour through this forest, we reached the cleared valley containing the cottages of the colonists, several of which we passed before reaching the one in which we remained. These cottages are generally of small size, although much superior in cleanliness and neatness of arrangement to those belonging to the same class of Brazilians. At night we slung our hammocks in a small apartment, and enjoyed a sound sleep till morning,

My friend being desirous of having a few days shooting in the woods with one of the Germans, I determined to accompany them, in the hope of making some additions to my Botanical stores. We set off early, entering the wood about a mile from the cottage. Here, as in similar situations near the town, I observed a great deficiency of herbaceous vegetation, and in a walk of about two hours only collected a few Ferns. In passing through this wood, we saw an enormously large tree, a species of *Lecythis*; the ground beneath it was covered with its curious pot-like capsules nearly as large as a man's head, their resemblance to a pot being much increased by the large lid which falls off from the top of each when the seeds within are ripe. Most of those we saw were empty, the nuts having been taken out by the monkeys, who are very fond of them. Leaving this wood, we suddenly came upon another cleared valley, containing the ruins of several cottages; this, we were told, had been the first

site of the settlement, but as the colonists were forbidden to cut any more wood in that direction, they moved their quarters to the place before mentioned. Near these dismantled dwellings we found abundance of pine-apples, and refreshed ourselves with some which were ripe, sheltering ourselves from the sun under the shade of an out-house which had formerly served as a place for the preparation of Farinha from the Mandiocca root. Near this place I found two beautiful trees, one of them a species of *Vochysia*, covered with long spikes of bright yellow flowers, and the other the splendid *Moronobea coccinea*, literally covered with its globular crimson blossoms. In returning I collected specimens of a yellow-flowered *Palicourea*, called Mata Rato, not, however, the same plant which is known at Rio by the name of Erva do Rato. It proves, notwithstanding, that poisonous qualities are attributed to different plants of the same genus in different parts of the country.

Close to the main land, and about thirty miles north from Pernambuco, there is a small island called Itamaricá, which on account of its fine climate and soil, and the abundance and superiority of the fruit produced there, is designated the garden of Pernambuco. I was desirous of visiting this place before leaving the Province, and with this intention I started about the middle of December, and considered myself fortunate in having as a companion Mr. Adamson, a young gentleman who had been some years in the country, and fond of botanical pursuits. To make the voyage, we had to hire a Jangada, one of the raft-boats so common on this part of the coast; it was manned by a crew of three men. To a stranger it ap-

pears a very singular kind of craft, and had I not been well assured that, primitive as their construction seems, they are perfectly safe, I should have felt some hesitation in embarking on one of them. Having got our luggage properly placed on its elevated platform, so as to be out of the reach of the water which continually washes over these rafts, we commenced our voyage. The wind almost constantly blows at that season from the N.E., and, consequently, was nearly right against us, rendering it necessary to beat up between the reef and the shore; the intermediate distance varying from a quarter of a mile to two miles, all the way from Recife to the island. By four o'clock in the afternoon, finding that the unfavourable wind had prevented our performing more than half the voyage, we determined to land at a small fishing village called Páo Amarello, and there pass the night. It was not without some difficulty that we obtained a shelter wherein we could sling our hammocks; after meeting with several refusals, the owner of a small public-house (Venda) pointed out an empty hut made of cocoa-nut leaves, and permitted us to take possession of it for the night. Hither, therefore, we moved our luggage, and after a supper of stewed fish and farinha, slept soundly till day-break. After getting up, we took a walk a little way into the country; the soil we found to be sandy, and the herbaceous vegetation completely scorched up by the drought. At this place the reef is about a mile distant from the shore, and is distinctly perceptible along its whole line, both at high and low water, for although the ebb tide leaves the rocks quite bare, the surf marks its position even at the highest flow. The wind having now

shifted more to the eastward, we were enabled after breakfast to proceed on our voyage, and as we made much more rapid progress than on the preceding day, we reached the island at noon, and landed on the eastern side of it at Pilar, the principal town.

We carried with us two or three letters of introduction, and the first we delivered obtained us quarters. The name of our host was Alexandre Alcantará, the proprietor of a large salt-work, of which there are several on the island. His house, like nearly all the others we saw, was of one story, the walls consisting of a frame work of wood, the interstices of which were filled up with a kind of clay, and the roof was covered with tiles; there were four good rooms in it, all floored with boards; it was delightfully situated near the sea, and surrounded by cocoa-nut trees. In the afternoon we were taken by our host to see his salt-works, which were established in a valley into which the tide flows at high water. The water from which the salt is made, is kept in large reservoirs, whence it is from time to time made to flow into pits where it is allowed to evaporate. At this place, which is called Jaguaribe, there are twenty-four distinct manufactories, belonging to as many individuals. The place where the water is evaporated is divided into small compartments measuring sixteen feet by twelve. In that belonging to Senhor Alcantará, there are one hundred and twenty such compartments; into each of these, two inches of water is allowed to flow from the large reservoir, and in eight days this is completely evaporated. It yields him, altogether, annually, about four hundred alqueires of salt, each alqueire weighing eight arrobas, and each arroba thirty-

two pounds. Three qualities are produced, the best being used for domestic purposes, a middle sort for curing of fish, and an inferior kind used principally to salt hides. On an average it brings about two and sixpence an alqueire, so that his whole income from this source is only about £50 a year. Besides the manufactories at this place, there are others in different parts of the island.

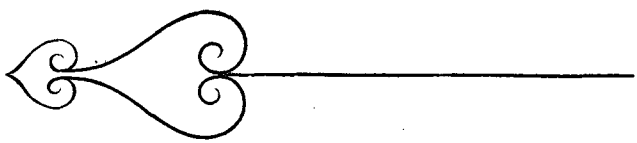
The island which is separated from the main land by a strait about half a league broad, is nearly three leagues in length, and from one and a half to two in breadth. It contains only two small villages, viz., Itamaricá, situated on a height near the sea, on the south-east side, containing only about twenty houses; and Pilar, the place at which we landed, formed of a few irregular streets, and containing about eighty habitations. The whole number of houses in the island, we were told, amounted to three hundred, and the entire population to about two thousand. Although there are many very comfortable looking dwellings, yet the mass of the houses have a poor appearance, being either formed of wicker-work and mud, or of cocoa-nut leaves. As fishing is the principal occupation of the inhabitants, their houses are generally near the shore. The fish are mostly taken in pens (curaes) that are constructed of stakes a little beyond low water mark. Another source of income to the inhabitants, is the cocoa-nut trees, which form a dense deep belt round the upper part of the island; both the fish and nuts are taken to Pernambuco for sale. In the interior of the island there are three sugar plantations; and several of the more wealthy of the inhabitants cultivate grapes and mangoes to a considerable extent, both of which sell well in Pernambuco, bringing

a better price than those cultivated elsewhere in the province. Good grapes I bought at tenpence a pound, but they give the cultivator a great deal of trouble, as the vines are sure to be attacked by a large brown ant, and stripped of their leaves in a single night, unless care be taken to have the lower part of the stem isolated by water. The whole of the province of Pernambuco is much overrun by these insects. During the time of our visit the mangoes were just getting into season, and I found them to be very much superior in flavour to any I had previously tasted; they are much smaller than those cultivated near Pernambuco, and very much resemble peaches in colour.

During the few days we remained on the island we made many excursions through it in all directions; instead of the almost uniformly level character of the country in the vicinity of Pernambuco, here there is a gentle undulation of hill and dale. There is not much large timber, the wooded portions generally consist of small trees and shrubs, which give to many parts of the island an aspect more like that of an English orchard, than an uncultivated equatorial region; some of the views we obtained from the hills, if not grand, were at least pleasing. Though there are both a priest and a lawyer on the island, there is no medical man; and as soon as I was known to be one, my assistance was solicited from all quarters. The first individual I was requested to visit, was a man with a large abscess in the neck, from the suppuration of the right submaxillary gland; he could neither speak nor swallow, and his relatives thought him on the point of death. I opened

the abscess, which gave him instant relief, and next day when I called, he was sitting up, and able to overwhelm me with thanks for what he conceived to be a miraculous cure. This case so established my reputation, that I had more medical practice than I desired. Two of my patients were in the last stage of consumption, but by far the greater proportion of the cases resulted from intermittent fever, chiefly arising from derangement of the digestive organs, accompanied with enlargement of the spleen. Consumption is rare in Brazil, during the whole of my travels I did not meet with more than half a dozen cases. As I would receive no fees, many presents of fish, fowls, and fruit were sent me.

I have said that the chief occupation of the inhabitants is fishing, and that the fish are nearly all taken in pens (Currals). These enclosures are very common all along the coast of Pernambuco, and are of the following shape.



They are made of strong stakes, driven firmly into the ground at the distance of a few feet from each other, the interstices between them being afterwards filled up by small straight rods closely tied together. The straight line of rods is sometimes nearly a quarter of a mile in length, and runs out away from the shore; it answers the purpose of guiding the fish into the enclosures at the

far end of it. The day before we left the island, we accompanied our host to visit the Curral belonging to him, in order to witness the method of taking fish; they are only visited at low water. We went in a canoe to the entrance of the innermost enclosure; our host then stripped himself, as did also another person who accompanied us, and entered the inner enclosure, taking with them a small net a little deeper than the water, with a short pole fixed to each end of it. One of the men then fixed one of the poles perpendicularly close to one side of the entrance to the enclosure, while the other began to unfold the net, closing with it the entrance so as to prevent the escape of the fish; he then walked round by the side of the enclosure till he reached the other person, when the net was rolled up, thus enclosing in it all the fish contained in the Curral, which amounted to about a dozen very fine ones. We were informed that at this season very few are taken, so few, indeed, that they are scarcely sufficient for the consumption of the families to whom the Currals belong; in the rainy season, however, they are taken so abundantly, that boat-loads of them are sent to the Pernambuco market. We returned to Recife in a large canoe.

CHAPTER IV.

ALAGOAS AND THE RIO SAN FRANCISCO.

The Author's Motive for this Excursion—Voyage to the Southward—Description of the Coast and Observations on the great Restinga—Reaches Barra de S. Antonio Grande—Arrives at Maceio—Description of the Town and surrounding Country—Resolves to visit the Rio S. Francisco—Embarks in a Jangada and coasts to the Southward—Batel—Lands at Peba—Journey thence to Piassabassù on the Rio San Francisco—Ascends the River to Penedo—The Town Described—Productions of the District—Its Population—Voyage up the River—Mode of Navigation—Arrives at Propihà—Vegetation of the Country—Description of a Market Fair—Dress of the People—Voyage continued to Traipù—Passes the Ilha dos Prazeres—Barra de Panema—Abundance of Fish of the Salmon Tribe—Village of Lagoa Funda—Island of S. Pedro—Its Indian Population described—Continues the Voyage—Fearful Storm—Return to S. Pedro, Serious Illness and detention there—Scarcity of Food—Renounces in consequence all intention of proceeding further—Returns to Penedo—Scheme for Navigating the Rio San Francisco—Reason why it will never succeed—Arrives again at Maceio—Visits Alagoas—That City Described—Leaves Maceio—Coasting Voyage—Singular Mode of catching Fish—Return to Pernambuco.

THE great object of my visit to the north of Brazil was to make a journey from the coast to the high lands which lie on the eastern side of the Rio Tocantins. This part of the country, which I was strongly recommended to visit by Von Martius, and others, on account of its bota-

nical riches, is distant from Pernambuco about 1,200 miles, and nearly directly west from it. Although I was desirous to begin this journey, I was advised by persons well acquainted with the interior of the country not to undertake it till towards the end of the rainy season, on account of the difficulty of finding grass and water for the horses after the period when everything has been scorched up by the burning sun of the dry season. Nor is the period of the rains less exceptionable for the undertaking of a long journey, since, during the four months which it generally lasts, there are scarcely two consecutive dry days. It was now about the end of January, and as the period of my entering upon my proposed expedition would not be sooner than the end of June or beginning of July, to pass the intervening time I determined to visit Maceio, a small sea-port town in the province of Alagoas, about half way between Pernambuco and Bahia; and from thence to make an excursion to the Rio San Francisco, and, if possible, up that river to the great falls of Paulo Affonço. As no other conveyance was to be had for Maceio, I was obliged to take a passage in a large canoe which was going down loaded with goods.

It was about three o'clock in the afternoon of the thirtieth of January, 1838, before I could obtain my passport, upon which I immediately embarked, and after undergoing the necessary examination at a custom-house boat, we got outside the reef, and ran down before the north-east trade-wind till seven o'clock, P.M., when we came to an anchor for the night in a small sandy bay about four leagues to the south of Pernambuco. During the passage we several times ran foul of the stakes of

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fishing pens which are common along the coast. I may here describe the nature and appearance of the craft in which I was embarked; it was about forty feet long and three feet broad, being the trunk of a large tree hollowed out; a few feet at each end of it was decked over, and the little cabins so formed were filled with parcels and provisions; when empty they served as sleeping berths for the crew, which consisted of the master and two men. It had a single long slender mast to which a triangular sail was fixed, the lower part of which was stretched out by a long boom; a little below the gunwale on each side were lashed two logs of light buoyant wood, nearly as long as the canoe, of the same kind of which jangadas are made; while these enable her to carry more cargo, they serve also to prevent her from upsetting, and give a place to walk upon, as the cargo, in our vessel, rose two feet above the body of the canoe. It may well be imagined that there was but little comfort in such a conveyance, as I was obliged to sit constantly upon one of my trunks, with no other shelter from the sun and rain than that afforded by an umbrella. On the shore close to where we anchored, two large fires were burning, by the light of which we saw several people and three or four huts. I was anxious to land here, to obtain if possible a place to sleep on, but the master said he would not venture to go on shore as he was not on good terms with some of the inhabitants, and did not choose to risk himself among them. After supping, therefore, with the crew on oranges, farinha, and boiled salt-fish, I wrapped myself in my poncho, and laid down on my trunks, and slept, but certainly not com-

fortably, till morning. At dawn of day we again got under way, and about eight A.M. passed Cape St. Augustino, a rocky point, behind which the land rises from one to two hundred feet above the level of the sea; this is eight leagues to the south of Pernambuco, the intervening country being one continued flat. During the whole of the day we ran down very close to the shore, always keeping between it and the reef. The country is of an undulating hilly nature, wooded with small verdant trees and shrubs, many of the latter covered with flowers. The beauty of the coast, although a little monotonous, was, notwithstanding, some recompense for a day of continued exposure to the sun. At eight o'clock in the evening we again came to an anchor, at a place where the master was well known; here we landed, and I found that my quarters for the night were to be a smith's work-shop; next day, however, I ascertained that it was the best house in the place, being formed of wicker-work and mud, while the others were composed of stakes and cocoa-nut leaves. The following morning the master of the canoe took me to the house of a relation, about two miles further along the shore, where we met with a kind reception. As some of the cargo of the canoe had to be landed here, and more taken in, we remained here all day, which I did not regret, as it rained heavily till night; on this account I was prevented from making an excursion into the country, although I did not perhaps lose much, as, in one short walk, I found nearly the whole herbaceous vegetation burnt up. The land here rises higher than at any other place between Pernambuco and Maceio, the faces of several low hills exhibiting a kind of coarse grained

sand-stone rock, exactly of the same nature as the reef which runs for several hundred miles along the coast both to the north and south of Pernambuco. This reef, which is covered with small shells and coralloid substances, Mr. Darwin supposes either to have been formed by a bar of sand and pebbles formerly existing below the water, which was first consolidated, and then elevated; or by a long spit of sand, running parallel to the coast, having had its central part consolidated, and afterwards, by a slight change in the set of currents, having the loose matter removed, so as only to leave the hard nucleus. Neither of these suppositions, I feel fully satisfied, account for the origin of the reef, because, at the place where we now were, I could trace, at low water, a rocky connection between the reef and the rocks of which the hills were composed. It is more probable that the reef owes its origin to the decay of the rock between it and the shore, but in what manner I will not attempt to explain. This sandstone, as I will hereafter show, belongs to the lower series of the chalk formation.

We slept at the house of the relation of the master of the canoe, who was a tailor by trade, and an acknowledged poet and wit: in the society of whom and his family, consisting of several sons and daughters, the time passed away most agreeably. Early in the morning of the following day we again pursued our voyage, keeping, as before, close along the shore, and at about two o'clock, P.M., we arrived at Barra de S. Antonio Grande, a small village about nine leagues to the north of Maceio, consisting of about one hundred houses, the greater part of which are made of cocoa-nut leaves, and are mostly

situated on a projecting point of flat land, bounded on one side by the sea, and on the other by a small river of the same name as the village, both deriving their appellation from a large bar of white sand which stretches across the mouth of the river at some distance from the shore. The inhabitants live principally by fishing, but I was informed on my arrival at Maceio, that it is a place much resorted to by slave vessels for the delivery of their cargoes, and it certainly appears to be well suited for such a purpose.

In the afternoon I took a walk a little way along the banks of the river, but did not find much to interest me; like all other sandy parts along the coast, the vegetation here consists of low shrubs mixed with a few small trees; *Schinus terebinthifolius* being by far the most common. One of the most striking vegetable productions near the village is a large wild fig-tree growing close to the river, beneath the shade of which four large canoes, larger than the one in which I arrived, were being constructed; this also forms a rendezvous for the gossips of the village, who assemble there in the afternoon, beneath its wide-spreading branches which reach nearly to the ground, thus shading them from the sun. The leaves of the tree are about six inches long and three broad, with fruit about the size of a large gooseberry. In the evening I strolled through the village, and found that nearly all the inhabitants had turned out of their houses to enjoy the beautiful moonlight and the delightfully cool evening breeze; many of them were squatted on the bare ground, some were lounging on mats, while others were stretched out on cocoa-nut leaves. In most of these groups, one

or more of the individuals, generally young men, were amusing the others by playing lively airs on the guitar. As the master of the canoe belonged to the village, I was invited to sleep at his house, but as he could not afford me a bed, I was obliged to repose on a hide in the corner of a small room; scarcely, however, had I fallen asleep when I was awoke by legions of hungry bugs, that came pouring out from the cracks in the mud walls; unable to endure this torment I got up, and taking the materials which formed my bed outside the house, I shook them well, and spreading them in the open air, I slept there comfortably till morning. This was the only time during the whole of my travels that I was annoyed to any extent by this insect, which is not nearly so common, nor so abundant as the flea.

Next day, Feb. 4th, we left Barra de San. Antonio Grande about mid-day, and reached Maceio at five o'clock in the evening. Shortly afterwards I delivered the letters of introduction I had brought with me from Pernambuco to Mr. Burnet, the only British merchant in the place, who kindly invited me to remain with him during my stay. The town of Maceio is of considerable size, containing about 5,000 inhabitants; previous to the independence of Brazil, when the Portuguese were expelled by the Brazilians, the population amounted to upwards of 7,000, and as these were the principal capitalists, the trade of the place has declined considerably ever since. The town itself stands on a platform about fifty or sixty feet above the level of the sea, and distant from it about a quarter of a mile; but at a little more than a mile to the north-east there is a small village called Jaragua,

close to the sea, where there are two wharfs for the loading and unloading of goods, and a custom-house. The bay of Maceio is of considerable size, forming a kind of semicircle, and affording good anchorage for shipping. Formerly much cotton and sugar were shipped from this port in British bottoms, but now scarcely more than two or three English vessels visit it in the course of the year, the greater part of this produce being sent either to Bahia or Pernambuco. The country round Maceio is not so monotonous and flat as that around Pernambuco; low undulating ridges of hills reaching close to the sea, covered with a vegetation of low trees and shrubs. During several walks which I took in the vicinity, in company with a young Scotchman who had been sometime resident there as a medical practitioner, I made many additions to my botanical collections, particularly on a flat sandy tract to the north-east of the town. Among these I may mention a fine *Diospyros*, a curious *Eriocaulon*, *Marcetia taxifolia*, an *Eschweilera* different from that found at Pernambuco, and a *Melocactus*. Maceio is considered more unhealthy than Pernambuco or Bahia, ague being of very frequent occurrence, particularly at the beginning of the rainy season.

The Rio San Francisco being only thirty-two leagues to the southward of Maceio, and learning that it was navigable without interruption for upwards of a hundred miles, I resolved to visit it. A Portuguese gentleman, however, to whom I was directed for information on the subject, having, a few years before, made the voyage up to the great falls (Cachoeira de Paulo Affonço), informed me that as it was then the season at which the river rises

to its greatest height, the head waters being far to the south, he would not advise me to undertake the voyage, in consequence of the dangerous navigation at the period of the floods, as well as from the little chance there would be of my adding much to my collection, from the dried up state in which I should find the vegetation, owing to the long continued drought. Still I determined to go, as nothing better presented itself to pass the time, and hitherto, moreover, I had always found the difficulties of travelling much less than they were represented to be. I considered myself fortunate in being able to hire, as a servant, the black who accompanied the gentleman above alluded to.

Having made the necessary preparations for the voyage, I engaged a jangada to take me along the coast to the mouth of the river, and left Maceio at five o'clock, A.M., on the morning of the 15th of February. I intended to have left at eleven o'clock the night before, at the rising of the moon, but when I reached the beach with my luggage, the owner of the jangada was no where to be found, although he had faithfully promised to be waiting for me. I immediately sent Pedro, my black servant, in search of him, who soon afterwards returned unsuccessful; and I had no resource but to walk backwards and forwards on the beach till shortly before five o'clock in the morning, when he made his appearance. On questioning him about his absence, he told me with the greatest coolness, that as I did not arrive exactly when the moon rose, he thought I should not come till morning, and that, in order to pass the time, he had gone out to fish. Having at length embarked, we soon lost sight of Maceio

under the influence of a strong north-east wind, and, coasting along a flat shrubby shore, we arrived at night at the mouth of a small river, on the south bank of which, about a mile up, there is a little village called Batel. At this place, which is twenty leagues distant from Maceio, we remained for the night. I preferred sleeping in the jangada to one of the small cocoa-nut-leaf cottages that was offered to me, but I had reason to repent of having done so. It was full tide when we arrived at the village, and the jangada was brought close to the shore, so that when the tide ebbed it was left dry. I did not then recollect that all muddy shores covered with mangroves, particularly at the mouths of rivers, abound with mosquitos, but I was soon reminded of the fact by being awoke about midnight with my face and hands smarting and swollen from the bites of those annoying insects. As I slept in my clothes without any covering, I was obliged to shield my face with my pocket handkerchief, and thrust my hands into my pockets. Although I was thus in some measure protected from their bites, it was long before I could again fall asleep, from the continued humming noise, almost as loud as that of bees, which they were making around me. When I got up at day-break, after a restless night, I found that besides the mosquitos, I was surrounded by thousands of a small black sand-fly (*Meruhy*), not much larger than a grain of fine gunpowder, but whose bites are no less irritating than those of their larger congeners. The morning tide, we found, did not rise so high as it did on the previous evening, and it was with some difficulty that the jangada was floated into deep water, which was not effected till nearly

nine o'clock, A.M. In crossing the bar at the mouth of the river, we had to pass through a line of small breakers, three of which swept right over the elevated platform on which I was sitting, and drenched me to the skin, thereby rendering the remainder of the voyage, seven leagues, very uncomfortable. It was one o'clock, P.M., when we reached a little village called Péba, which is situated on the coast, about five leagues to the north of the mouth of the Rio San Francisco: this was the termination of my sea-voyage, as the heavy surf which breaks over the shallow bar of that river will not allow jangadas to enter it. The village is situated a little way inland, and is hidden from the sea by a high embankment of sand, which at this place is very much drifted by the wind; it is, however, recognised at a considerable distance, from the number of tall cocoa-nut trees which grow near the shore. I was here particularly struck with a fact which goes a great way to explain the phenomenon of the stem of a fossil tree being found passing through several strata of sandstone rock. Many of the cocoa-nut trees have their stems embedded, to the depth of fifty feet and upwards, in the embankment of sand which stretches along the shore, and in many places is several hundred feet broad; some of them, indeed, are so deeply embedded, that the nuts can be gathered without climbing the tree. Now as this sand has accumulated at different periods, particularly during the prevalence of the north-east trade-wind, it must present, if ever it becomes hardened, a vast number of irregularly horizontal beds, through which the stems of the palms will be found to pass.

From a fisherman, whom I met on the shore, I obtained

permission to occupy an empty hut till the following day. While seated on an old trunk of a tree, which was lying on the beach about high-water mark, I observed that along the shore here, as well as all along the coast, crabs of various sizes abounded; and, as I had to wait for some time till my luggage was landed and carried to the hut, I amused myself by watching the operations of a small species, belonging to the genus *Gelasimus*, that was either making or enlarging its burrow in the sand. About once in every two minutes it came up to the surface with a quantity of sand enclosed in its left claw, which, by a sudden jerk, it ejected to the distance of about six inches, always taking care to vary the direction in which it was thrown, so as to prevent its accumulation in one place. Having a few small shells belonging to a species of *Turbo* in one of my jacket pockets, I endeavoured to throw one of these into its hole, in order to see whether it would bring it up again or not; of the four that were thus thrown, one only entered the hole, the others remaining within a few inches of it. It was about five minutes before the animal again made its appearance, bringing with it the shell which had gone down, and carrying it to the distance of about a foot from its burrow, it there deposited it. Seeing the others lying near the mouth of the hole, it immediately carried them, one by one, to the place where the first had been laid down, and then returned to its former labour of carrying up sand. It was impossible not to conclude that the actions of this little creature, which holds so low a station in the chain of beings, were the result of reason, rather than of blind instinct by which the actions of the inferior animals are

generally thought to be guided, for man himself, under the same circumstances, could not have acted with more judgment.

On the day following our arrival at Peba, I made arrangements with the owner of an ox-cart to take me with my luggage to Piassabassú, a little village situated on the north bank of the Rio San Francisco, and about two leagues distant from its mouth. He promised to come early in the forenoon, but, much to my annoyance, did not make his appearance till five o'clock in the afternoon, shortly after which we started. We kept along the sandy shore for about two miles, then went a little inland and continued our route in a direction nearly parallel to the shore, through a flat, sandy, bushy country, in which *Mouriria Guianensis*, Aubl., and several species of *Lauraceæ*, were very abundant. It was indeed dark during the greater part of the journey, but on my return I had ample opportunity of observing the nature of the vegetation. I was not at all sorry, after we had once started, that we had been thus delayed, as travelling in this country is far more pleasant in the evening than during the heat of the day. Our cart was of a very primitive construction, similar to that seen everywhere in the interior of Brazil, and little different from that used by the Romans. It consisted of a rude frame, supported on two wheels about five feet in diameter, constructed of solid plank; and was drawn by six oxen, yoked in pairs, goaded on by two drivers, each carrying a slender pole about ten feet long. One of the drivers goes before to lead the way, while the other urges on the oxen with his long pole. The axles are never greased, and the

creaking noise they continually make, which we heard at a great distance, is most disagreeable; the reason given for not greasing them is that the cattle are so accustomed to the noise that they would not go on without it. It was ten o'clock at night when we arrived at the end of our journey, and as there was no place where a stranger could put up, and being without introduction to any resident in the village, I was taken by our conductor to the house of one of his acquaintances, where the only accommodation to be obtained was in a small and very dirty apartment in the hut, which did not much signify, as I slept in my own hammock.

Piassabassú is a small village, where the greater part of the houses surround a large square with a church in its centre, these are nearly all of one story, and, being white-washed on the outside, they present a cleanly appearance. Many of those situated nearest to the river, were abandoned on account of its flooded state, being then higher than it had been since the year 1793, when the inundation reached to a still greater height. On the morning after our arrival at this place I hired a canoe to convey me to the Villa do Penêdo, seven leagues further up the river. We started at eleven o'clock, A.M., but the current was so strong that the canoe was obliged to keep close along shore to be able to make way against it; a small sail, by which we were propelled, was often barely sufficient to keep us from being carried downwards; at such times our two men were forced to use their paddles. At Piassabassú the river is about two leagues broad, but the opposite side cannot be seen on account of a large island which stands in the middle of the stream; it was only

after we had proceeded upwards about half a league, that I first saw the whole breadth of this magnificent river. The country, for about three leagues, is flat on both sides, which the present flood had inundated to a considerable extent. We passed large fields of sugar-cane, where nothing was to be seen but the tops of the leaves, which, waving in the stream, gave them the appearance of verdant meadows; where trees existed, nothing but their upper branches were visible, and almost every house that we passed had only its roof appearing above the water. The river begins to rise in the month of October, which is the commencement of the rainy season in the southern provinces, the sources of its origin, and continues to do so until the end of March. At about five leagues from the coast, the country, on the south side of the river, slightly rises, and from thence to Penêdo it is of an undulating character, but the opposite side still continues flat. After pursuing our course upward about two leagues on the north, we crossed over to the southern bank, in order to obtain advantage of the breeze. A few sugar plantations exist on both sides, but the vacancies in the forests made by the cultivated spots are scarcely apparent. By the force of the stream, particularly in certain turns of the river, the banks were greatly encroached upon by a continual process of undermining, and we saw great masses of earth falling in, the trees which grew thereon being floated down by the current. We did not come in sight of Penêdo till within a league of it, when, turning round a high rocky wooded point on the south side, the white houses were seen brightly lighted up by the rays of the sun, which was then just setting nearly opposite to the

town. Shortly afterwards we distinguished Villa Nova, a small town situated about half a league below Penêdo, but on the south side of the river. As the Rio San Francisco divides the provinces of Alagoas from that of Sergipe, it will be seen that the Villa do Penêdo is in the former, while Villa Nova is in the latter.

It was too late when we landed, to deliver the letters of introduction which I brought from Maceio, and, as the boatmen would not remain till morning, I sent my man Pedro to look out for a house in which I might lodge for the night. After being away for more than an hour he returned, and told me that he had much difficulty in finding one, owing to almost every house being crowded by the many families driven out of their homes by the flooded state of the river. I should have preferred an empty house, but as this was not attainable, I caused my luggage to be taken up to the only one Pedro could procure, which I found belonged to a young girl, who lived alone in it, following a profession which is not considered so disreputable in Brazil as in most other countries. In a small apartment of this house we therefore passed the night, in our hammocks, which were slung from one side of the room to the other. During the voyage up the river I saw several large reeds in flower, and great plenty of a large yellow-flowered *Jussiæa*. A little way below Penêdo, *Machaonia spinosa* grew abundantly, forming a good sized spiny shrub, having large panicles of small white flowers, called by the Brazilians, Espinha branea: of this I collected specimens, as well as of a species of *Oxypetalum*, bearing large umbels of sweet smelling flowers, not unlike those of *Hoya carnosa*.

On the following morning I delivered the letters of recommendation I had with me from Maceio. One of these was to the chief magistrate of the district (the Juiz de Direito), Dr. Manoel Bernardino de Souza de Figueiredo, by whom I was most cordially received, and invited to reside with him till an opportunity occurred for proceeding further up the river. I returned immediately to my lodging in quest of my luggage, but before this could be dispatched the Juiz returned my visit, and, on discovering my poor quarters, he expressed much regret that I had not proceeded directly to his house on my arrival. One of the greatest inconveniences that a traveller meets with in Brazil, is the difficulty of finding accommodation, for in none of the towns or villages throughout this vast empire, does there exist an inn of any kind except in the principalities of Rio de Janeiro, Bahia, and one or two others in the mining districts, and even these are kept by foreigners. It will be long before such conveniences come into general use, for the Brazilians when they travel, always carry with them their own servants, provisions, cooking apparatus, and beds; and it seldom happens that an empty house of some description or other is not to be had in any village during their journey: should they fail to do so, during the dry season they content themselves by encamping under some large trees, slinging their hammocks from one branch to another. It was in this manner that I afterwards was forced to travel, often being for months together without sleeping under a roof. The Brazilians are particularly attentive to any stranger recommended to them, and, during the whole of my wanderings, I seldom went from one place to another without letters, nor do I remember a single

instance in which I was not courteously received by those to whom they were addressed.

The Villa do Penêdo, so called because it is situated upon an elevated rocky point, on the north bank of the river, is about thirty miles from its mouth. The rock on which it stands is a fine-grained yellowish-coloured sandstone, the strata of which incline from east to west. The streets are irregular but the houses are very substantial, the principal ones being of two stories, and are for the most part built of the same stone as that on which the town stands. It contains about 4,000 inhabitants, the greater part of whom are very poor. There are no less than six large and substantially built churches, to one of which is attached a convent of Franciscan Friars, called Nossa Senhora da Corrente, but it only contains three brethren. In the Comarco, or district of Penêdo, sugar and cotton are the principal articles cultivated, the greater part of these plantations being situated on the margin of the river, below the town. Mandiocca, french-beans, and rice are raised in sufficient quantities but only for consumption. Formerly, cattle were reared to some extent in the more inland parts of the district, but this source of production has failed in consequence of the occasionally excessive drought, and also because of the abundance of a tick (*Carrapato*), which sometimes proves so great a plague that a farmer loses his whole stock in a single season. During the Portuguese dynasty, Penêdo was a flourishing place, but is now rapidly falling into decay. The following census of the whole Comarco, which was taken in the year 1837, I owe to the kindness of the Juiz de Direito, and I consider

it worthy of being quoted, to show the proportion which the different races bear to each other in this part of the country.

Whites	22,045.
Free Mulatos	32,694.
Mulato Slaves	4,531.
Free Blacks	10,113.
Black Slaves	10,876.
Native Indians	2,331.
In all	82,590.

Three days after my arrival at Penêdo, we heard that an empty canoe was going up as far as the river was navigable, and accordingly I engaged a passage for a small sum. Having made all the requisite preparations for my voyage, I left Penêdo at one o'clock, P.M., on the 22nd of February, carrying with me letters to some of the principal inhabitants of the different places at which we were likely to stop. The canoe in which we embarked was a very large one, being about forty feet long and four broad. It is seldom that a single tree is of sufficient dimensions to form a canoe of this size, but when such is not the case, they hollow out the largest they can find, sawing it in two through the middle from stem to stern, and then give it the requisite breadth by the addition of one or more widths of plank between the two halves; in this same manner our canoe was constructed. One end of the bow, for the length of ten feet, was thatched over with cocoa-nut leaves like the roof of a house, which thus served both as a place of shelter from

the sun during the day, and as a sleeping berth by night. It had only one mast, which carried two large triangular sails of a very coarse cotton cloth, manufactured in the country, and these were stretched out on each side by a long boom. The sea-breeze generally reaches Penêdo about mid-day, blowing right up the river, and, with the sails spread out in this wing-like fashion, we went up the stream with great rapidity, notwithstanding that the current against us was very strong. As it is dangerous for small canoes to navigate the river when it is flooded, two of them are lashed side by side, and thus united, they form what is called an Ajojo. At six o'clock in the evening we reached the village of Propiá, situated on the south side of the river, and seven leagues distant from Penêdo. It contains about 250 houses, mostly small, and built of wicker work and mud; many of those in the street parallel with the river were half full of water, and consequently abandoned; such, also, we observed to be the case with many houses which we passed during our voyage.

The most striking objects of vegetation which I observed on the banks of the river, were many trees of considerable size, belonging to the natural order *Leguminosæ*, bearing large spikes of light purple flowers; abundance of a curious kind of *Cactus*, reaching to the height of from twenty to thirty feet, the great fleshy and naked arms of which, stand out like the branches of an enormous chandelier. A most striking difference was to be observed between the verdure of that part of the country which, for upwards of four months, had been under water, and the more elevated parts, on which no rain had fallen for

nearly six months. The latter had more the appearance of the deciduous woods of Europe in winter, than such as grow within the tropics are generally supposed to present. It was only here and there, that a tree was to be seen covered with leaves, all the others having lost their foliage, owing to the excessive and long continued drought. In sailing up the river, the prospect would have been dreary, had it not been for the broad belt of arboreous vegetation that clothed its margins. The country between Penêdo and Propiá is of a low hilly character, but about two leagues above the former place, a rather high ridge of mountains is seen on the north side, about eight leagues from the river, called the Serra de Priáca; and about four leagues further up, a high conical mountain called the Serra de Maraba is seen, rising from the surrounding flat country like a pyramid, in a N.N.W. direction, about six leagues distant. A market, or fair, is held at this village every Saturday, and as the owner of the canoe wished to make some purchases for his return cargo, I was detained here two days. On the morning after our arrival, I walked a little way into the country behind the town, but found the vegetation so completely scorched up, that not a green thing was to be seen. I then directed my steps to the bank of the river, and collected specimens of two species of *Cæsalpinia*, which were beautifully in flower, as well as a low shrubby species of *Croton*, which is very common, its wood, when broken, having a fragrant smell not unlike that of a *Calycanthus*.

The preparations for the fair created some bustle, as during the whole of the previous day, particularly towards evening, canoes continued to arrive from all quarters with

articles for sale; and from the inland part of the country numbers of horses came into the village laden with merchandize. As I slept in the canoe, which was moored amidst a number of others, I was awoke early on the morning of the fair, by the noise of a motley multitude of men, women, and children of all colours, from the deep black African, to the scarcely white inhabitants of Brazil. The place where the market is usually held being then under water, the crowd had assembled on an elevated part of the river bank toward the west end of the town, opposite to which all the canoes were made fast alongside each other. As soon as I was dressed, I took a walk through the crowd to observe the kind of goods exposed for sale, and as might be expected I found them extremely various, consisting, principally, of articles of food and dress. Among others of inferior note may be particularized the following as being the most abundant:—Farinha de Mandiocca, dried beef, large fish, mostly sturgeon, from the river, dried in the sun, sugar in large loaves shaped like cheeses, or in smaller ones in the form of bricks, molasses in large leathern bottles, fresh beef, bananas, soap, shoes, English cotton cloth and prints, ropes made from the fibre of native plants, tobacco, planks and posts for house-building, earthen-ware, cooking utensils, and water pitchers, brought by the Indians, leather, hides, rum, &c.

The great variety in the style of dress adopted by these people, is the first thing to strike the eye of a stranger. The better classes wear either light jackets and trowsers, or shirt and trowsers only, over which they put a long dressing-gown of printed cotton, to which is added during

the cool of the morning and evening, a cloak of Scotch tartan. They seldom wear stockings, but have their bare feet thrust into a pair of brown leather slippers. The country people generally wear a broad brimmed hat made of leather, and sometimes a leathern jacket; but most commonly their only covering consists of a pair of thin cotton drawers, which reach a little below the knee, and a shirt of the same stuff hanging loose outside of them. The negroes usually dress in the same manner as the whites, but the women have much more taste than the men, many of whom appear literally in rags, though apparently as happy in this attire, as if they were of the best description. I observed here more of the aboriginal inhabitants of Brazil, than I had ever seen at one time before; many of them bore evident signs of having a mixture of white, and others of black blood in their veins, but not in sufficient quantity to destroy the peculiar obliquity of the eyes, and the lank black hair of the American race.

It was about three o'clock in the afternoon before we could leave Propiá, and at eight we arrived at Traipú, another small village situated on the north bank of the river, about seven leagues further up. At half a league from Propiá we passed a small village called Collegio, and at a further distance of two leagues and a half a still smaller one, called San Bras, both situated on the north side of the stream. As far as the latter village, the appearance of the country on both sides of the river bears much the same appearance as that above Penêdo, but at a distance of a about a league above San Bras, it becomes much higher, the undulating ridges of hills reaching close to the water in many places, thus diminishing the breadth

of the stream, and, consequently, increasing the rapidity of the current. The highest part of the country is a hill opposite Traipú, the termination of a range called the Serra de Tabangá. The effects of the drought on the vegetation was still greater here than further down; as far as the eye could reach, nothing like a forest was to be seen, both the hills and valleys being thinly covered with small trees and shrubs, and all, with a few solitary exceptions, denuded of their foliage. On the surface of the ground itself there was no herbaceous vegetation, the red coloured soil alone being seen through the withered bushes. Here and there along the banks a few houses exist, but none were to be observed inland. The only objects that relieved the eye in this desert-like region, were the green bushes which grew along the inundated banks, and the grotesque *Cacti* abounding in dry rocky places. These latter are the most conspicuous objects that meet the eye of a voyager; some of their trunks are of immense thickness, and their branching tops reach to a great height above the surrounding vegetation. These are certainly the most remarkable looking plants of the many which clothe the surface of our globe, their huge fleshy branches seeming more the work of art than of nature. It is only plants such as these, that are able to retain their verdure during the long droughts to which the country here is subjected. On the rocky places where these grow, there are also many *Bromeliaceous* plants, which in spite of the want of rain, not only grow luxuriantly, but produce their large red clusters of flowers in the greatest perfection. The rocks on which these plants vegetate are of gneiss, in thin layers of a dark colour, full of small garnets, and

cropping out at a very obtuse angle towards the south. We remained for the night at Traipú, and at nine o'clock next morning resumed our voyage, but as the wind was very high, we could make no way against the current; at about half a league from the place of our departure we were obliged to halt for some hours on the north bank of the river. This afforded me an opportunity of landing, when I made a few additions to my collections. Among these was a species of *Azolla*, which existed in the greatest abundance, in a flat muddy place that was slightly flooded. Here also I met with some of the largest *Cacti* I have ever seen; one in particular was of enormous size, the stem measuring upwards of three feet in circumference, and unbranched to the height of about ten feet; its entire height could not be less than between thirty and forty feet. This and other large kinds of *Cactus* are called by the inhabitants of this part of the country Sheeke-sheeke, and their fleshy stems and branches, after being stript of their back and spines, are roasted and eaten in times of scarcity; under similar circumstances they are given raw to cattle. A little below this place on the south side of the river, we passed an old Gold-working, situated on the side of a low hill through which a small ravine passes. It seemed to have been a long time since it had been worked, as the heaps of soil which had been thrown out, were covered with the low shrubby vegetation peculiar to the district. Continuing our voyage, towards sunset we came in sight of a small island, of considerable elevation, in the middle of the stream, called the Ilha dos Prazeres, on the top of which there is a church of the same name. Opposite this island, on the north side, we

passed the mouth of a small river, called the Rio de Panêma, which takes its rise in the Sertão of the province of Alagoas. On the upper side of the mouth of this river there is a little hamlet, consisting only of a few houses, called Barra de Panêma. A little further up we crossed over to the south side, to land an old negro who had accompanied us from Propiá, and it was with much regret that we were obliged to come to an anchor for the night a little way above this place, for the river here takes a turn to the northward, and although there was a strong breeze, we could not succeed in getting our canoe into a position to enable us to avail ourselves of the favourable wind, notwithstanding the best efforts of our crew, which consisted of three men, assisted by myself and servant; an exposure of our vessel to a side wind would have upset her, and she was too unmanageable to attempt rowing.

On the following morning, before breakfast, I took a walk to a high ridge of gneiss rocks, which is at a little distance from the river, and found a variety of different kinds of *Cacti*. One of these was a great *Melocactus* much larger than the one which is so common near Pernambuco; it grows in fissures of the rock where scarcely any soil exists, and its tough roots penetrate to such a depth, that they can with difficulty be withdrawn; living specimens of this (*Melocactus Hookerianus*, Gardn.) which I sent home, now exist in the collections at Kew and Glasgow. While lying in the canoe, waiting for the breeze, I heard a splashing noise in the water as of heavy rain, but on looking over the side, I found it to be produced by hundreds of small fish; so abundant were they, that having no hook, I had recourse to a bent pin fixed to

the end of a thread, and thus in a few minutes I caught above thirty of them. I found them to belong to the tribe *Salmonidæ*, of which they form a very diminutive species, measuring from two to three inches in length, and from an inch to an inch and a half in depth; they are called by the Indians Piába; the two lower thirds of their depth is of a silvery-white, while the upper third is of a pale lead colour, being in general appearance not much unlike a herring in miniature; they are extremely voracious and abundant, especially in shallow water, where they are caught in numbers by children; they make an excellent dish when stewed. From a young man who was fishing in a shallow part of the river with a hand-net, I obtained a few other kinds of fish, and among them one which is very much dreaded by the inhabitants of the banks of nearly all the lakes and rivers in the northern provinces; it is called Piranha by the Brazilians, and is also one of the *Salmonidæ*, belonging to the genus *Serasalmo*. It is commonly about a foot in length, but sometimes is as much as two feet long, being very much compressed laterally, and very deep; the back is of a dark brownish colour, and the belly yellowish white, both being thinly marked with reddish spots; the lower jaw projects a little beyond the upper, and both are armed with about fourteen flattish triangular shaped teeth, upwards of a quarter of an inch in length, and very short. It is most voracious, and is consequently caught without difficulty. Many people are often severely injured by them whilst bathing, and I have repeatedly been shown the scars left by their bites. It is said that ducks frequently lose their legs, in consequence of their voracity, and it is

even asserted that where they abound, cattle have been known to perish from their attacks, when going into the water to cool themselves, or to drink.

We resumed our voyage again about eleven o'clock in the morning, and at one reached Lagoa Funda, a small village on the north side of the river, the distance being about two leagues. It contains but a very few houses, and takes its name from a large deep lake which runs westward from it, in a direction parallel with the river. During this voyage we came in sight of a range of mountains called the Serra de Pão de assucar, bearing N. N. W. of us; it terminates abruptly towards the W. S. W., and slopes gradually thence to the E. N. E. and is by far the highest range in the district. The country around us was now beginning to assume a verdant appearance, several showers of rain having lately fallen. Shortly after our arrival at this place, owing to the loss of the wind, we were obliged to remain till five o'clock in the afternoon, when the sea breeze reached us, we again started, and were enabled by half past six o'clock to reach another small village called San Pedro. This is situated on an island of the same name, which is about half a league long by a quarter of a league broad, being flat, with a sandy soil; the upper end where the village stands, is open, while the opposite extremity is densely wooded with bushes and small trees.

I passed the night in the canoe, but could get little sleep owing to the mosquitos which were very abundant. Early in the morning I took a walk over the island, and gathered a few plants; during the day the heat was most intolerable, the thermometer in the shade about noon, in-

dicating 99½°, and as there was not the slightest breath of wind, the oppressive sensation amounted almost to suffocation, the air feeling as if it came from the mouth of an oven. Not a soul was to be seen out of doors, and the few goats and pigs on the island, as well as the dogs, sought the shade of a few trees of *Zizyphus* which grow by the side of the river near the village. Everything was as still as midnight, the songs of the small birds which I had listened to with delight during my morning's walk, and the loud shrill cry of the Gavata, a large water bird, as well as the monotonous one of the Bem-te-ve, were now no longer heard, even the trees were motionless, and the mighty mass of yellow water in the river rolled slowly down unruffled by a breeze; all was indeed so still, that one could scarcely help thinking that life had ceased to exist. Having slung my hammock under a *Zizyphus* tree, I remained in it till the rays of the sun became less powerful. It was six o'clock in the evening before the sea breeze reached the island, and it being then too late to proceed on our voyage, we remained where we were for the night. The sun had no sooner set, and the breeze become more fresh, than the greater number of the inhabitants left their houses, and seated themselves either at their doors, or by the side of the river, to enjoy the delicious coolness of the evening air; of course I followed their example, and it was near midnight before I retired to rest.

The number of families on the island amount to about forty, and are for the most part civilized Indians. On the evening of our arrival I was presented to their captain, an old man dressed in a leather hat, a pair of coarse cot-

ton drawers, a shirt of the same material, and a pair of leather sandals on his feet, who was sitting under a *Zizyphus* tree repairing a fishing net. From him I learned that the Indians on the island are decreasing gradually in number, and he sighed when he told me that the day was not far distant when his race would become extinct, or at least be amalgamated with the other inhabitants. Those who still remain unmixed, are short in stature and of a stout make; in disposition they appeared gentle and obliging. I observed a church in the village, but during my visit the priest was absent on the main land.

On the morning of the twenty-eighth, the second since our arrival, I again took a walk over the island, and in the centre of it found a large tract covered with a very prickly species of *Opuntia*, covered with the Cochineal insect. I also collected several species of *Viscum* and *Loranthus*, growing on the branches of *Mimosa* and *Zizyphus* trees; while the sandy shores of the south side of the island yielded me abundance of *Ehrenbergia tribuloides*, Mart., and a Lupin-like kind of *Zornia*. The morning was comparatively cool, but the day was calm and sultry, the thermometer standing at 96° in the shade. As it was again six o'clock in the evening before the breeze set in, we were once more detained. The setting in of the breeze was accompanied with a curious appearance in the atmosphere; the sun was setting in the west with a fiery redness, surrounded by a mass of red coloured clouds, while from the eastward was seen approaching an immense body of vapour; this from the distance at which it was seen had more the appearance of smoke issuing from some great conflagration. This body came slowly on before the wind

till at last it reached us, and we could see the small vesicles of which it was composed rolling past. The wind for about five minutes was so hot that every one was glad to take shelter from it, but it soon acquired its usual refreshing coolness. On enquiring of the old captain whether such a phenomenon was often observed, he told me that it was of frequent occurrence at the beginning of the rainy season, and added, that long experience had taught him it was always the forerunner of a great storm, (*hum temporal.*)

On the following day, the first of March, we left the island, about half past five o'clock in the evening, and had not been gone an hour before the sky towards the N. E. became darkened with a mass of black clouds, the sure harbinger of a coming storm. We were then nearly in the middle of the river which was about a league broad; and as the storm was approaching with great rapidity, the master of the canoe gave instant orders to run her in to the north shore, but before we had half reached the distance, we were overtaken by a gust of wind which laid her nearly on her broadside. A considerable quantity of water was shipped, and the crew lost all command of themselves, one crying to do this, and another that, without anything being done. The lower part of the sail on the lee side was in the water keeping the edge of the canoe down, and had it not been for my exertions and my man Pedro's assistance, in seizing hold of the rope by which the extreme point of the long boom is drawn up to the mast head, and thus rising it out of the water, the canoe, to a certainty, would have filled, and we should all have been inevitably drowned. Still we were at some

distance from the river bank, and the storm was setting in with all its fury, the waves were dashing over the weather gunnel, while the lee side was taking in great quantities of water. In the mean time the sails had been stowed away, and seeing the danger of keeping her broadside any longer to the wind, the master gave orders to run her over to the other side of the river before the wind. We thus steered in an oblique direction nearly three miles before we reached the south side, and during this fearful interval the wind, the rain, thunder and lightning, were such as I had never before been exposed to. It was now quite dark, but the vivid flashes both of forked and sheet lightning gave a light, from time to time, as brilliant nearly as noon-day. The canoe ran aground among some small trees to two of which she was made fast; the rain continued to fall in torrents for nearly two hours, and from our unavoidable exposure to its influence we were all drenched to the skin. When the storm had entirely exhausted itself, we found that the wind had died away also, and as we could not resume our voyage, we determined to return with the current to the island of San Pedro. This we accordingly did, and had to remain in our wet clothes during the greater part of the night. In going down I observed a number of large meteors passing from the N. E. to the S. W. following the course of the storm.

The two following days were again calm, with heavy thunder storms in the evening, so that we were compelled to remain all this time on the island. A more serious event, however, now occured to detain me among the Indians. The day after the storm before mentioned, I found myself feverish and unwell, and two days after this I was

severely attacked with dysentery, which is of frequent occurrence at this season, caused no doubt by the sudden transitions of temperature. In the meantime, a favourable breeze had sprung up, and as I was far too ill to proceed, the canoe was obliged to sail without me; I was thus left behind in an old hut, the floor of which was still wet from having been a short time before overflowed by the river. In this place I was confined in my hammock for five days, during which time I was so ill that I never expected to recover; from being in robust health, I was in the course of these few days reduced to a mere shadow, with scarcely the power, when I did get out of my hammock, to drag one leg after the other. I felt severely the want of my medicine chest which I had left behind at Máceio, not wishing in this branch excursion to encumber myself with luggage, my only resource, therefore, was to trust to the remedial agents employed by the people themselves. This I found to consist in the use of castor oil, which is commonly made on the island, and afterwards a drink, *ad libitum*, of strong lemonades of vinegar and white sugar. There was only one venda in the village, in which the latter materials were to be obtained, but where, strange to say, the only other purchaseable article was rum. Nothing in the shape of provisions was to be had for any consideration, and as our long stay here had completely exhausted our stock, both Pedro and I were almost reduced to a state of starvation. Not even a particle of farinha was to be had, and had we not been supplied with a fowl or two, by an old Indian woman who attended very kindly upon me during my illness, we should have been miserably destitute. While still confined

to my bed, I sent Pedro to another small village a few leagues further up the river, to purchase, if possible, some provisions, but he returned altogether unsuccessful. My chief regret was for this poor fellow, for he was well and felt the pangs of hunger far more keenly than I did. In the meantime, a canoe fortunately arrived at the island with a little farinha for sale, of which I bought as much, at four times the usual price, as would suffice to take us back again to Penêdo, for I had now renounced all idea of going further up the river. The poor inhabitants of the island were themselves literally in a state of starvation, their principal food being the fruit of *Geoffroya superba*, the produce of a small tree growing rather abundantly on the south side of the island. It reaches to the height of nearly twenty feet, and produces a fleshy drupe about the size of a walnut; it is called *umarí* by the Indians. In almost every house, whether Indian or Brazilian, I observed a large pot of this fruit preparing, either in doors over a fire made on the floor, or on the ground under a tree in the neighbourhood of the house. As soon as they are nearly ready, groups of children in a state of nudity, and half naked men and women seat themselves around the pot, each furnished with two stones, a larger and a smaller one, for the purpose of breaking the nut after they have devoured the outward fleshy part; the taste of the kernel is not unlike that of boiled beans. Fish is in general the staple food of these people, but this is difficult to procure when the river is much flooded.

At the west end of the village there is a large wide spreading *Zizyphus* tree standing alone, and as these trees retain their dense covering of leaves all the year

round, their shade is sought after both by men and animals during the excessive heat of the day. Under that of which I now speak were to be seen a number of villagers of both sexes, the women squatting on mats spread on the ground, and occupied in spinning with a distaff, a coarse kind of cotton yarn used principally as wicks for tapers, which they make of a brown coloured native wax. The men are much less industrious than the women, being generally to be seen standing about in a state of idleness, or swinging in their hammocks, either in their houses or beneath the shade of a tree. Under the large *Zizyphus* tree, several hammocks are hung up every morning, and they are seldom unoccupied. On Sundays the women lay aside their spinning apparatus, but immediately after mass, groups of them may be seen playing cards, at which they continue during nearly the whole day; as they do not play for money, they use only french beans as counters. Until I gained sufficient strength to leave the island, I also spent much of my time under the shade of this tree, either listening to the conversation of these people, or answering the thousand and one questions put by them respecting my own and other distant countries. These questions were often sufficiently ridiculous, and I could often perceive that my answers were considered as stretches of the long bow, although they were too polite to say so; nor was it only among the poor islanders of San Pedro, that I observed this to be the case, for the same often occurred among those who were considered well educated people. I remember once to have been conversing with the President of one of the inland provinces about Steam Navigation, and on telling

him that many of the English Steam-boats were now entirely constructed of iron, he did not say that he did not believe me, but simply remarked "that in Brazil, when iron was put into water it always sank."

On the twelfth of March I took leave of my Indian friends, and embarked in a canoe which I hired to take me down to Penêdo, having been exactly a fortnight on the island. We reached that place on the morning of the fourteenth, when I received a kind welcome from my friend the Juiz de Direito. I landed several times during the passage, for the purpose of making collections of living plants of the different kinds of *Cacti*, which grow in great abundance on the banks of the river, wherever they are rocky. At one of the places where we stopped, I observed several fine trees of *Peltophorum Vogelianum*, Benth. This tree, which belongs to the natural order *Leguminosæ*, reaches to the height of about forty feet, and has a great branching top: the leaves are large but very much subdivided, and very graceful, having more the appearance of the frond of a fern, than the leaf of a tree. The racemes of flowers which grow at the ends of the branches, are often more than a foot long, and the flowers are of a beautiful golden colour; at a distance it presents a more magnificent appearance, than almost any other tree I have seen. The canoe was carried down the stream by the force of the current, but in the afternoon, and during the greater part of the night, the sea breeze blew so strong as to impede our progress. The boatmen, however, adopted a plan to overcome this, which I have never seen elsewhere, nor even heard of, and I will therefore explain it in a few

words. Landing at a place where trees grew in abundance, the men set to work, and cut off a considerable quantity of branches, which were tied tightly together with cords, one end of a long rope was made fast round its middle, while the other end was secured to the canoe. They then steered for a part of the river where the current was strong, and threw the bundle overboard, which being heavy from its green state, floated just below the surface of the water, and in this manner being entirely out of the influence of the wind, it received the whole force of the current, by which means, the canoe was dragged down at a rate little inferior to that by which we descended during the calm of the day.

I remained at Penêdo eight days, and, thanks to the very great kindness I received from the Juiz de Direito, my health rapidly improved, and I was enabled to make several little excursions in the neighbourhood. The Juiz is one of the few Brazilians I came in contact with, for whom I entertain feelings of esteem and respect. I found him to be a man of much intelligence, and well educated, having studied at the University of Coimbra. Even among the litigious Brazilians he was respected as a judge; and, indeed, both his opinions and actions were those of a mind deeply imbued with benevolence. At Coimbra he had paid some attention to the study of Botany, to which he was still partial, but more to the theoretical than to the practical department. He had made the acquaintance of M. Reidel and Dr. Natterer, both of whom had lived with him some years before, when he was residing in Pará. In the society of this excellent man, as well as in that of his bro-

ther, a priest who was then on a visit to him from Bahia, in the perusal of his books, and in visiting some families in the town, my time passed away very agreeably.

One day I went to Villa Nova, to visit a Colonel Bento Mello Pereira, the owner of a large sugar plantation. After receiving an invitation to return to dinner, I walked over to view his plantation, which was about two miles distant, but did not meet with much to reward my toil, for the sun was hot, and the country dry and sandy. I reached his house again a little before two o'clock, that being the dinner hour, where I found that two other persons both belonging to the place, had been invited also. The dinner was both substantial and excellent, being served up with some degree of ostentation. We had a slave to wait upon each of us, and before beginning, a little black fellow supplied us with water from a large silver ewer in a silver basin to wash our hands, bearing round his shoulders, a long towel with which to dry them. After dinner he took me to see a vessel he was building, a little above the town; it was about one hundred and fifty tons burden, and nearly ready for launching. He intended her to trade along the coast, but principally to convey sugar to Bahia; the planking consisted of *Pao Amarello* and *Oiti*, said to be the two best woods for shipbuilding in the north of Brazil. I do not know to what genus the *Pao Amarella* belongs, but the *Oiti* is the *Moquilea tomentosa* of Bentham, first described from specimens which I forwarded to him from Pernambuco.

A proposal has recently been made to establish a communication by steam navigation, between the coast and the interior central provinces of Brazil, by means of the

Rio de San Francisco. Upon a mere inspection of the map of this portion of the Empire, it would seem that every facility for this specious proposition has been offered by nature; an easy, cheap, although somewhat circuitous water conveyance leads directly from the sea on the confines of the province of Pernambuco into the heart of the inland, rich, and comparatively well-populated mining and diamond districts, which are separated from the great markets of Rio de Janeiro and Bahia by lofty mountain barriers, always difficult of access, and where the means of transport are tedious and costly. I have great doubts whether this plan will ever be carried into effect, in support of which opinion I will adduce three very substantial reasons.

In the first place, the bar at the mouth of the river is about two leagues broad, is always covered with a heavy surf, and has seldom more than four feet of water on it. In the second place, at the falls of Paulo Affonço there is a series of rapids and falls about sixty miles in length, forming a serious obstacle to the progress of any navigation. In the third place, there is a very limited population throughout the intervening country, which is not likely to increase, owing to the desert nature of the greater portion of the interior; from these causes the amount of produce likely to be taken to the coast must, consequently, be very small indeed, so that the enterprize would not be likely to succeed in a pecuniary point of view, even were it otherwise practicable. Were the interior of the middle portion of Brazil as fertile as is generally supposed to be by those who have never visited it, hopes might be entertained of its becoming hereafter a rich agricultural dis-

trict, such as the belt of country along the coast is found to be; in that case some great national undertaking for rendering communication more easy, might be looked for; but while it exists as a dry arid tract scarcely fit for the rearing of cattle, it is not at all likely that any Brazilian at least will sink his money in attempting to render the San Francisco navigable. A company of Englishmen may probably be induced in periods of infectious speculation to venture upon this attempt, for some of the late ill-concerted schemes in Brazil have been far more absurd; in testimony of which we may instance that monument of folly, the Rio Doce Company.

The North Americans, particularly those of the back settlements, are celebrated for their inquisitiveness; but this seems to be a very general failing with all those who are shut out from frequent intercourse with strangers; a curious instance of this feeling occurred a few days after I returned to Penêdo. I had brought letters from Maceio to a gentleman who lived here with a married brother, they were among the most respectable people in the place. Although not yet eleven o'clock I found the lady, a remarkably fine and good-looking woman, with her husband busily engaged at cards, she lying in a hammock, while he was seated on a chair beside her; she had recently been smoking, an almost universal accomplishment among the ladies of the interior,—as a long pipe was lying near her, and the floor beneath bore strong indications of excessive expectoration. I was desired to be seated, and was immediately inundated with a flood of questions from the good lady who possessed a great volubility of tongue. Among a host of others I

may enumerate the following. What countryman are you? What is your name? How old are you? Are you a medical man? Are you married? Are your father and mother alive? What are their names? Have you any sisters? What are their names? Have you any brothers? What are their names? Have all your countrymen blue eyes? Have you churches and priests in your country? Do oranges and bananas grow there? &c., &c. If, however, she was inquisitive about my concerns, she was not less disposed to tell me much that related to herself. Thus she informed me that she was married when she was nineteen years of age, that she was now five years married, and in that time had presented her husband with a yearly gift, all of whom were alive with the exception of one. Her husband she said was thirty-six years of age, and she desired me to feel his pulse, as he was always complaining of bad health. I soon discovered his complaint to be indigestion, one of the most frequent ills that Brazilians are subject to, arising, no doubt, from the enormous quantities which they eat, and that generally not of the most digestive materials, as well as from the late heavy suppers which they indulge in. I had then to feel her pulse in turn, and she seemed much pleased when I told her it was an excellent one. I afterwards became very intimate with them, and spent many agreeable hours in their society; their brother to whom I brought the letters was a lawyer, and a well educated and intelligent man.

On the afternoon of the 21st I bade adieu to the Juiz, and my other friends in Penêdo, and between eight and nine o'clock in the evening embarked in a canoe which I

had hired to take me down to Piassabassú, which we reached after a sail of little more than four hours. As I knew of no house to go to, I was obliged to pass the remainder of the night in the canoe, tormented by mosquitos, which were in such abundance that long ere morning I was obliged to go on shore, and walk up and down till daylight. The house in which I slept when I passed through the village before, was now empty, but I was allowed to occupy it, and as I could not get a cart to convey me to Peba before the following evening, I had to remain here a longer time than I intended. This interval I devoted to a few Botanical excursions in the neighbourhood, and thereby added several new plants to my collections. On reaching Peba I again had the use of the little hut which I formerly occupied, and was obliged to remain there two days before I could hire a jangada to take me to Maceio ; that which I engaged was a fine large one that had never been to sea, and on the morning of the 26th, having got all my collections and luggage put on board, we began our voyage. Peba I found to be nearly, if not quite, as poor a place as the Ilha de San Pedro, and not a single article of provision could be purchased there. Its inhabitants are principally fishermen, and their chief food is fish and farinha ; a want of success in the fishery and a bad crop of mandiocca, had thrown them quite into a state of starvation. On the evening before we started, Pedro contrived somewhere to purchase a chicken, and when we embarked our whole stock of provisions consisted of one of its wings, and a few green cocoa-nuts. Before we left, the owner of the canoe sent to Piassabassú to purchase farinha or french beans, as sea stock for his

men, but neither were to be procured; the crew, therefore, consisting of three men, had to content themselves with only a few green cocoa-nuts. It rained the whole of the first day, but the elevated part of the jangada on which I lay, being well roofed over with cocoa-nut leaves, I suffered but little inconvenience in consequence. At night we did not put in to shore, as is usual with these crafts, the men being as anxious as myself to reach Maceio, but the wind being light we could not make much progress. During the succeeding day the winds were again light, but having freshened towards evening we reached Maceio about eight o'clock P.M.; the surf, however, running so high along the beach that I would not allow the jangada to run on shore, as by doing so my collections would have been completely spoiled. The crew wished me to remain on board till the tide went out, but I had suffered too much from hunger during the voyage, to think of staying any longer, so leaping into the water with Pedro, immediately after a large wave had passed us we followed it, and reached the shore before another had time to overtake us, but not without being completely drenched. Leaving everything on board to be landed next day, I immediately set off for the house of Mr. Burnett, about a mile distant, and arrived just in time for tea, when, after changing my clothes I made a most comfortable meal, being the first I had enjoyed for two days.

Wishing to see the city of Alagoas, the capital of the province, I made arrangements for visiting it, and started from Maceio on the 31st of March. This city is situated on the south side of a large lake which runs inland about forty miles, and is about twenty miles distant from Ma-

ceio. There is a narrow entrance to the lake from the sea, about two leagues to the south of the latter place; but still further to the southward, there is another inlet from the sea, which runs northward to within a mile of the town, and by means of a small canal which has been cut, canoes can now approach within a very short distance of the houses. Accompanied by a young countryman, I embarked in a light canoe about midnight, with the view of reaching Alagoas early in the morning, and thus escape exposure on the water during the heat of the day. My man Pedro was our only navigator, who used a long pole, the mode usually adopted for propelling canoes, as the lake is extremely shallow. As soon as we were fairly afloat on the canal, we laid down in the bottom of the canoe to sleep, but failed to do so, in consequence of the myriads of mosquitos and sand flies that almost fill the atmosphere among the mangroves that abound along the muddy shores. At eight o'clock in the morning we came in sight of the city, which is built upon a somewhat elevated situation, and as the houses are rather large, and intermingled with numerous churches, and lofty mango trees, it has really an enchanting appearance when seen in the distance. In about an hour afterwards we landed, and as I had brought no letters of recommendation, I despatched Pedro to look out for a house where we could remain till morning, but he returned after being an hour absent, with the intelligence that none was to be obtained. This did not annoy me much, as we found an old house close to where we landed, where I proposed to remain, especially as the weather was fine, the only shelter we required being shade. Just, however, as we were

about to remove our luggage thither, the owner of an adjoining house perceiving that we were strangers, invited us to take up our quarters with him, an invitation which we readily accepted, as it would be not only more comfortable, but would allow us greater freedom to walk about. Like most other Brazilian cities in which I have been, Alagoas looks better from a distance than on close inspection; and as in the instance of Penêdo, it has all the appearance of having once been a much more flourishing place than it now is, the expulsion of the Portuguese having given its industry a death blow, from which it is not soon likely to recover. The houses are for the most part built of stone, and many of them are what are called *Sobrados*, that is, consist of more stories than one, but many of them are falling into decay; even the principal streets are overgrown with grass and other weeds, and have a deserted appearance. The finest buildings are the churches and convents; of the former there are eight, and of the latter two in number. It being the seat of the provincial government, the President resides there, but as Maceio is the chief place of trade, there is also a government house in that town for his accommodation, when he visits it, as he frequently does, for the transaction of business. The population of Alagoas amounts to about 6000. On one or two occasions that I walked through the principal streets I saw very few people, and they for the most part were bare-footed, ragged mulato, and Indian soldiers, two of whom were keeping guard at the house of the President.

The chief productions of the country around Alagoas are sugar, cotton, and a little mandiocca. At the time

of my visit great complaints were made of the scarcity of provisions, but it is impossible to feel much commiseration for the starving condition of the poor people, when it is known that it is entirely owing to their own want of industry that sufficient crops of mandiocca are not raised, not only for their own consumption, but for exportation to other parts of the country. There is abundance of ground around the city lying waste, which is well adapted for the growth of this plant, and but little labour suffices for its cultivation, but the indolent disposition of the people is such, that, with all the advantages which the country offers, they are contented to obtain just sufficient for immediate use and seldom look forward to the future. Towards the head of the lake, the country is said to be much richer than it is near the city, and it is in that direction that the largest and most productive sugar and cotton plantations are seen. The lake is not of sufficient depth to admit of vessels of any size, all traffic between the sea and the city is carried on in large canoes, and a small class of flat bottomed sailing vessels called Lanchas. Opposite the city the lake is about a league broad, the water is quite fresh, and yields abundance of fine fish, which forms the chief part of the animal food of the inhabitants, to whom it is sold at a very cheap rate. Much fine timber is floated down the lake from the upper parts of the country for exportation along the coast; the two wooden bridges at Pernambuco are for the most part constructed of it.

During my rambles in this neighbourhood, I found several species of plants which I had not previously met

with. In a small stream of beautifully clear water the curious *Cabomba aquatica*, Aubl. grows abundantly, which to the Botanist is a most interesting plant, as, both in habit and structure, it forms a transition link between the *Ranunculus* family and that of the water lilies. In the same stream I likewise collected specimens of a *Marsilæa*, a pale blue flowered *Pontederia* and a large white flowered *Nymphæa* different from that which grows in the lake at Olinda. In brackish water a little above Maceio, a *Potamogeton* grows in vast quantities, which on comparison, does not seem to differ from the British *P. pectinatus*. We returned to Maceio by daylight, and I observed that the shores abound with Mangroves, principally *Rhizophora Mangle*, which reaches here to a much greater size than I have elsewhere seen it, some of the trees being, at least, thirty feet high, with stems proportionally thick; it presents a curious appearance, the large roots supporting the stems at the height of several feet above the water, and curving outwards and downwards; if the real top were not seen, we could almost fancy that the tree had been reversed; the long pendent radicles of the seeds are also remarkable, as they are thrown down to the ground while the fruit is yet attached to the parent plant. The wood of this tree is very much used as fuel, it burns extremely well in the green state; at Maranham little else is used for this purpose.

On the morning of the 20th of April I left Maceio, in a little vessel loaded with cotton, and arrived at Pernambuco on the evening of the 24th, taking Pedro with me, he having agreed to accompany me on my projected

journey into the interior. The only thing which I observed worthy of notice on the passage, was a mode of fishing that was new to me. Towards the evening of the third day, while running along between the reef and the shore, the vessel grounded on a sand bank, the tide being then about half ebb. Having laid down to sleep on the deck, I awoke about nine o'clock, and was surprised to see a great number of lights moving quickly between the shore and the reef, and extending as far as I could see. Our boatmen were at this time sound asleep, but as the tide was now out, and the ground around us dry, I made for the nearest lights, and found them to belong to a man and boy, both of whom were naked, each having a lighted torch in his left hand, a long sword-knife in the right, with a small basket suspended round the neck by a thick piece of cord. I soon discovered they were engaged in killing the small fish which the tide had left in the shallow pools of water inside the reef. They walked somewhat quickly along, holding the flaming torch pretty close to the water, by which means the fish, not above three inches long, were very distinctly perceived, and when seen, immediately struck with the sword, quickly picked up, and put into the basket. This man told me that all he expected to get, would scarcely suffice for the supper of the four individuals comprising his family. As the tide came in, the lights were seen receding towards the shore, and gradually becoming extinct. The material of which the torches are made, is the wood of a fine large arborescent species of *Bignonia*, to which the Brazilians give the name of *Pao d'Arco*, from

the circumstance of its being used by the Indians to make their bows They split this wood into thin splinters, a number of which are tied together, and when lighted, it burns with a very clear flame. Before castor-oil was so much cultivated as it now is, this kind of light was extensively used by the country people, even in their sugar-houses and other works.

CHAPTER V.

CEARA.

PERNAMBUCO TO CRATO.

The Author leaves Pernambuco in a Coasting Vessel—Description of the Voyage—Touches at Cape San Roque—Arrives at Aracaty—Seaport of Province of Ceará—Town described—its Trade—Whole Province subject to great droughts—Commencement of Journey into the Interior—Passes Villa de San Bernardo—Arid nature of the Country—Catingas—Arrives at Icó—Town described—Journey continued—Villa da Lavra de Mangabeira—Gold washings abandoned—Country begins to improve—Reaches the Villa do Crato—Town described—Low state of morals among the Inhabitants—Sugar Plantations—Mode of Manufacture—Coarse kind of Sugar formed into Cakes called Rapadura, in which state it is used throughout the Province—State of Cultivation in the Neighbourhood—Production of the Country—Serra de Araripe—Different kinds of timber—Wild fruits—Wandering Tribes of Gypsies frequent—Great religious Festival—Climate—Diseases.

On my return to Pernambuco from Maceio, Dr. Loudon kindly afforded me the use of his country residence, he having removed into the town, and I remained here from the end of April to the beginning of July. At the time of going there, the rainy season had just set in, when I observed the very striking effect which a few showers had already produced on the vegetation. Three months before, I had left the whole herbage scorched and withered

while the trees had a brown and sickly appearance; now all was fresh and verdant; grass and other herbaceous plants were covering the face of the earth, and bursting into bloom; and the shrubs and trees had assumed their summer dress, the deep green of the leaves harmonizing well with their various coloured flowers. The rainy season is here generally expected to commence about the middle or end of April, and continues till about the middle of August. At first, the rains fall in heavy showers, accompanied with thunder and lightning, but ultimately they become more frequent, lasting for half or an entire day, or even several successive days, with but very short intermissions; the longest period I knew it to rain without cessation, being thirty-six hours. At this season from the flatness of the country, the roads are so completely flooded, that it is impossible to move out on foot; and the atmosphere is so thoroughly saturated with moisture, that everything acquires a coating of blue mould; even books get so damp, that, unless exposed to the first sunshine, they become musty and are spoiled.

As it was impossible to stir much abroad, I occupied myself with arranging and packing my collections from Alagoas, in making preparations for my inland journey, and in dissecting and examining the structure of numerous animals found in the neighbourhood. I also made it my endeavour to ascertain which was the best route for the journey I had in view. Those who had visited the interior strongly recommended me to proceed by sea to Aracaty, a town in the province of Ceará, about two and a half degrees to the North of Pernambuco, and to start inland from that port, the roads being better than those

leading from other parts of the coast, and horses cheaper. I therefore determined to adopt this plan, and in the end found no cause to repent having done so. I received the best information from two Portuguese merchants named Pinto, who resided in Icó, a large town in the interior of the province of Ceará, and who had come to Pernambuco to purchase goods, which they are in the habit of doing once in every two or three years; they were the most influential people in that quarter, and I considered myself fortunate in making their acquaintance. In order to convey their goods to Aracaty, they had hired a small schooner, and accordingly I engaged a passage for myself and servant in the same vessel. A few days before we sailed I called with Mr. Goring, H.B.M., Vice Consul, upon the Vice-President of the province, Senhor Francisco de Paulo Cavalcante d'Albuquerque, (the President being then absent at Rio) with the view of obtaining my passport; we were kindly received, but with less frankness than when I visited the late President Camargo; Senhor Albuquerque is a man of considerable property, and belongs to one of the first and oldest families in the north of Brazil. Besides the passport, he sent me the next day letters of recommendation to the Presidents of Ceará and Piauhy.

After a delay of several days, I embarked at noon on the 19th of July, in the Maria Luiza, a schooner of about one hundred tons burthen; she was deeply laden, the cabin and deck, as well as the entire hold, being crammed with goods. We had, altogether, seventeen passengers on board, besides an equal number of negro servants or slaves; all brought much luggage with them, so that the

whole of the after-deck was completely covered with trunks and packages heaped on each other, the only clear space left being that requisite for the steersman; on each side were two kennel-like boxes, which served as the sleeping berths of the two Pintos, all the other passengers being obliged to make the best provision for themselves upon deck in the open air, for there was no accommodation whatever below, even for taking meals, every one, therefore, looked out for the most convenient corner to sit or lie down in. I could find no better quarters than those upon my own trunks, one of which being much higher than the other, offered a miserably hard couch, on which I was obliged to sleep at night. This was rendered still worse by the bad weather, for no sooner had we quitted the harbour than it began to rain heavily, from which no shelter could be obtained, except that afforded by my Poncho and umbrella, which did not long prevent me from being completely drenched. The misery of my situation may therefore be well imagined, and if some of my previous voyages were disagreeable, this was wretched in the extreme. My suffering was much aggravated by sea-sickness, from which I had always been quite free, but I experienced much inconvenience from this cause during the first two days, arising principally from too close contiguity to my fellow passengers; under any circumstances there is no malady that so entirely prostrates both mind and body, but in my present position, sometimes exposed to the burning rays of the sun, at others to heavy rains without the power or means of sheltering myself from their influence, this feeling was greatly aggravated. By the evening of the second day, I found myself so much re-

covered as to be able to sit up, and on the following morning to eat a little, my only food having been hitherto a few oranges, the most grateful of all things to a sick person. Many of my companions did not fare so well, as they continued to suffer till the end of the voyage.

For my passage and that of my black servant I paid twenty-six milreis, about three pounds five shillings sterling, which included provisions. These were regularly served out three times a day by the Captain from the top of the companion, and on these occasions, I was always greatly amused at the scenes which took place; every one rushed forward for his portion, and sometimes groups of twos, threes, and fours were to be seen eating with their fingers out of the same dish. There were only a few knives and forks, not nearly sufficient for the number of passengers, and these fell always to the share of those first served. Our food consisted for the most part of minced dried beef boiled with rice, to which was added morning and evening a cup of tea, and at dinner a bottle or two of miserable red wine.

One of my fellow-passengers was too remarkable a person not to be made mention of; he was an active, slender little fellow, about thirty years of age, rather well dressed, his physiognomy denoting a remarkable developement of the organ of language, a qualification which I found fully confirmed in him; he seemed to be well known to the other passengers, beguiled much of the tedium of the voyage by his amusing and extravagant stories, for which he possessed great talent, and seldom have I listened to one whose powers were greater in this respect. He was often called upon for a song, on which occasion he was accom-

panied by a young man who played well on the guitar. He told me that he was a native of Pernambuco and had visited Lisbon, and all the sea ports between Buenos Ayres and Pará, and he described many of the adventures that befell him on several of these occasions. In recounting these tales he generally seated himself cross-legged on the companion, and as he proceeded, his listeners were kept in one continued roar of laughter. The adventures of Gil Blas were nothing compared with his, and it is not improbable that many were manufactured for the occasion.

About noon of the second day we passed Cape St. Roque, and in the evening came to anchor in a small bay inside the reef, within a short distance of a suspicious looking schooner, which I have no doubt came in here to land a cargo of slaves, as there was no likelihood of her being in this solitary place for any other purpose. Early next morning we again got outside the reef, and continued our voyage, running before the S.E. trades which were blowing very freshly at the time. The weather now became much finer, and I could enjoy the cool fresh breeze, and observe the nature of the coast, to which we often approached so closely as to be within little more than gunshot of it; with the exception of a few white sand hills, destitute nearly of vegetation, it appeared extremely flat. About noon of the third day we made the bar of Aracaty, but as it was then low water, and too shallow to allow us to enter, we had to stand off till four P.M., when a pilot came on board who steered us into the smooth deep water in the mouth of the river inside the bar, where we came to anchor for the night, and were visited by a custom-house officer, who was more particular in examining my

luggage than that of any other passenger. When this was finished, and I had exhibited my passport, I was allowed to hire a boat to convey me to the town, situated twelve miles farther up the river, as the vessel could not get up till the following day.

The river on which the town of Aracaty stands is called the Rio Jaguaribe, and a little above the bar it is about a mile broad. For a considerable distance the western bank is comparatively high, but the eastern side is flat all the way up to the town. The lower part of the western bank is rather thickly wooded with small trees, but on both sides the shores are covered with mangroves. About a league and a half below the town, great numbers of the Carnahuba palm (*Corypha cerifera*, Mart.) makes its appearance. This palm, of which I afterwards passed through immense forests, reaches to the height of from twenty to forty feet, and besides being the most abundant, is one of the most beautiful of its size. The stems of the younger plants are generally covered all over with leaves, but as they get older the lower ones drop off, leaving only a tuft at the top, which is so arranged as to form a perfect ball. The leaves are fan-shaped, and not at all unlike those of the fan palm of the South of Europe.

The town of Aracaty stands on the east side of the river, and consists principally of one long broad street. It contains four fine churches, and the houses are generally of two stories. The population amounts to about 5000, the mass of whom are very poor. A considerable quantity of dried beef was formerly prepared here for exportation to other parts of Brazil, but this trade has fallen off very much, cotton and hides being now the principal

articles of export. Of the former about 5000 bags, or 25,000 arrobas of thirty-two pounds each, are exported annually, and of the latter about 2000. But little cotton is cultivated near the coast, the greater part of it, as well as the hides, being brought from the interior; the transport of these is effected at the end of the rainy season in large waggons, which are generally drawn by twelve oxen. During the time of the rains, the roads are impassable, and in the dry season, neither water nor grass can be procured for the cattle. The river runs close to the town, and at the end of the rainy season, when I was there, was somewhat less than a quarter of a mile broad; but during the height of the rains, it often rises twelve feet above its ordinary level, and then overflows the town. With the exception of a hill situated two and a half leagues to the S.W. of the town, and which rises six or eight hundred feet, and a few sand hills near the coast, the country all round is so flat, that the horizon is about as level as that of the sea. The houses are built of a frame-work made of the stems of the Carnahuba palm filled up with brick. The stem of this useful tree is used by the inhabitants for almost every purpose to which wood can be applied; it is so durable that the lower part, particularly of the full grown stems, lasts for many years, even when exposed to the weather; hence all the enclosures for cattle are made of them, for which purpose they are longitudinally split. The leaves are used for a variety of purposes, such as thatch, packsaddles, hats, &c; they also yield a kind of wax, obtained from the young leaves, which are covered with a glaucous bloom, by shaking them after they have been detached from the tree. Each leaf yields about fifty

grains of a whitish powder, and when a considerable quantity of it has been obtained, it is put into a pot and melted over the fire. Some years ago, a large quantity of this was sent to Lisbon, but was not found to answer any useful purpose; by the Brazilians it is sometimes used to adulterate common wax. In times of scarcity the young leaves are chopped up, and given to horses and cattle to eat, and the people prepare for themselves a kind of farinha from the inside of the young stems. The rains generally begin here in February, and end about the beginning of June. The whole province is sometimes liable to great droughts (*seccas*), the last of which occurred in the year 1825, during which no rain fell at all. The distress resulting from this calamity was very great, and the people still speak of it with the utmost horror; nearly all the horses and cattle were exterminated, and the loss of human life was very great, it being estimated that 30,000 of the inhabitants of the province perished. Great numbers of these died while attempting to reach the coast; wild as well as domestic animals fell victims to the want of water and food: these droughts have been observed to occur periodically. Aracaty was, during my visit, supplied with water of tolerable quality from a well near the town, but it was expected shortly to have an excellent supply from a spring about a league distant; the individual who undertook to procure this was Senhor Maya, a native of Gibraltar, who has been settled for many years at Aracaty; having received a privilege from government, he laid a brick channel for the water to run in, and as the spring is considerably lower than the town, he was erecting a force pump for the purpose of raising it; the water

from the well near the town, was sold through the streets in small barrels carried on low carts, which were often drawn by sheep. Senhor Maya expects to remunerate himself by the sale of the produce of his labour, which will certainly, from its superior quality, obtain preference.

As at Maceio, there is only one British merchant resident at Aracaty, Mr. Miller, to whom I had letters from Pernambuco, and in whose house I was hospitably entertained during the fortnight I remained here. I had also letters to several respectable Brazilians, from whom I likewise received many kind attentions, not the least of which were letters to their friends in the interior. Besides making the necessary preparations for my journey, I made a few excursions in the neighbourhood, and thereby obtained specimens of most of the plants which were then in flower, among these was a very pretty species of *Angelonia* (*A. arguta*, Benth.). As the Senhores Pinto were sending their goods to Icó in waggons, they obligingly allowed me to despatch, by this opportunity, all the heaviest portions of my luggage. I thus only required to purchase two horses at Aracaty, and these, two of the best travelling ones that were to be had, cost only about four guineas each. Having agreed to accompany the Pintos to Icó, we started on horseback from Aracaty, on the morning of the 3rd of August, in the midst of a heavy shower of rain, which, however, soon ceased. After riding through a dense forest of Carnahuba palms on a perfectly level sandy road, we crossed the river at the distance of about two leagues and a half from the town. The ford is called the Passagem das Pedras, from the rocky nature of the bed of the river. These rocks I found belonged to the gneiss series,

with the strata nearly vertical, the little inclination which they had, being towards the west in the direction of the hill already alluded to, called the Serra d'Areré, about half a mile distant. At nine o'clock we halted to breakfast in a large shed (*rancho*) by the roadside, and there we remained till the afternoon, for in travelling in the north of Brazil, where the heat is very great, the animals are always allowed to rest during the middle of the day, which is not the case in the south, where the whole day's journey is made at one stretch. The country during our morning's ride still continued flat, but in many places instead of being sandy, is covered with gravel and boulders of various sizes, the largest of the latter being about four feet in diameter, all more or less rounded, and consisting of granite, gneiss, and quartz. The great mass of the vegetation consisted of Carnahuba palms and a few small trees which grew among them, the most common of which is a species of *Patagonula*, called by the Brazilians *Pao branco*, from the white nature of its wood, which is chiefly employed as fuel. As we passed along, we raised numerous flocks of pigeons, some of which were not larger than sparrows, while others were the size of our domestic ones; and sporting among the leaves of the palms we observed several species of Parrots and Paroquets, besides a variety of beautiful small birds, one species being very numerous much resembling the common Canary. The notes of these birds were of course as varied as their kinds, that of the parrot tribe being particularly disagreeable, not unlike that of the English Rook, but the sound which most particularly caught my ear, was the monotonous aud distinct cry of the Bem-te-ve, a bird about the size, shape, and

colour of the Thrush. This name has been given to it from the resemblance of its note to the Portuguese signifying "I see you well," which it repeats in quick succession. Resuming our journey at three o'clock in the afternoon, and travelling through the same sort of country, we passed a small town towards dusk, called Villa de San Bernardo, which is ten leagues distant from Aracaty. It is built in the form of a square, the west side of which is principally occupied with a handsome church; and as it stands in the open plain (*vargem*) which is studded with occasional wide-spreading *Zizyphus* trees and Carnahuba palms, and as all the houses are whitewashed, it offers an imposing appearance when seen at a distance. About half a league beyond this town, we stopped for the night at a small house by the roadside; all the houses in this part of the country, which are not actually in towns, have a large veranda (*copial*) in front, and it is under this that travellers generally ask leave to rest for the night, there being hooks fixed from which hammocks can be suspended. As soon as the loads were taken off the cargo horses, and the saddles from those we had ridden, they were sent to graze in the neighbourhood, where they were left with their fore feet strapped pretty closely together, in order to prevent them from straying.

Early next morning by the light of a beautiful and clear moon we resumed our journey, but had not gone more than two leagues when I was prevented from accompanying my companions further by an awkward mistake made by my servant. In the hurry of departure, in the place of one of my horses, he had caught another of the same size and colour, belonging to someone else, and

it was not till daylight had fairly set in that the mistake was discovered. I had now to call a halt, and getting my trunks &c. put under the veranda of an old house, I despatched Pedro in search of my own animal. About two o'clock he returned bringing it with him, but as I found myself somewhat indisposed I determined not to proceed further that night. As there was no inhabited house near, we remained at the ruined dwelling, which my health did not allow us to leave for two days. As the road on which we proceeded is the highway to the interior of the province of Ceará, as also to the middle parts of the province of Piauhy, many travellers passed our encampment. Waggons loaded with cotton and hides were going downwards, while others, as well as numerous troops of horses, were passing upwards loaded with European goods and salt, the latter being a scarce and dear article in the interior. When afterwards I travelled through some of the most desert, and least inhabited parts of the inland provinces, there were two articles which were always asked for on my arrival at any habitation, first, gunpowder, and then salt; some of the poor beings scarcely taste the latter from one year's end to the other, their animal food being preserved by simply drying it in the sun, after it has been cut into thin slices. I had always to carry a stock of salt with me, and not unfrequently it has cost me as much as three shillings a pound, at the same time that I could purchase an entire fat ox for about ten shillings. To the European who is accustomed to travel without need of arms, and in comparative security, the appearance of the swarthy and brigand-like travellers here met with, each armed with horse pistols, sword, dagger, knife, and gun,

afford no favourable idea of the morals of these people. Murders and robberies are frequent among them, it being seldom that the one is committed without the other, when they always occur by treachery. From all I have seen and heard, I do not believe that one instance can be recorded of a Brazilian boldly facing another and asking him for his purse; one reason for this may be that each is aware that the other is armed with a knife, and hence he avoids coming within reach of it. Most of the very many murders which are committed in Brazil, are the result either of jealousy or of political hatred.

It was not till the afternoon of the 6th that I found myself sufficiently recovered to leave our solitary encampment, when we resumed our journey at a slow pace till after eleven at night. The moon had risen about six, and shone with a brilliancy such as I have seldom witnessed; this together with the coolness of the evening, renders travelling after sunset very agreeable, although to the naturalist it is not the most profitable. During the whole of my extensive journies I made it a rule never to travel at night, unless through a decidedly desert country, in order that nothing of interest should be overlooked. The seven leagues which we accomplished this evening was through a country of much the same barren nature as that we had already gone over, with the exception of one low range of hills covered with small trees and shrubs; on the level portion scarcely anything was to be seen but Carnahuba palms, Pao Branco, a *Zizyphus*, and a species of *Aspidospermum*, a small tree that grows gregariously and to which the inhahitants give the name of Pereira; the bark of it is very bitter, and its infusion is

used to destroy lice, and other vermin infecting cattle. We passed through several large open gravelly spaces (*varyems*), nearly destitute of trees, and the herbaceous vegetation that had sprung up during the rains, was now nearly parched up. The stillness of the night was only broken by the cries of a small species of Goatsucker (*Caprimulgus*), that was flying about in great numbers. We rested for the night under the veranda of a house close to the roadside, in approaching which we passed through a flock of several hundred sheep, being the greatest number I have seen collected together in any part of the country, but the excessive heat of the climate had wrought a remarkable change in their appearance, their skin being wholly destitute of wool and replaced by a short hair, not unlike that of a cow. In the same manner goats lose the long hair natural to them in cold countries, which proves how much the economy of animals can suit itself to change of circumstances. On the following morning we traversed a country still abounding with the elegant Carnahuba palm, and numerous small fresh-water lakes, teeming with wild duck and other kind of water fowl, and arrived at a place where there are several houses near to the Rio Jaquaribe, in the neighbourhood of which some small trees of *Cochlospermum serratifolium*, DC., were beautifully in flower, their large golden blossoms gleaming in the sun like oranges; here I found that in consequence of the pack-saddles being too narrow, the back of the cargo horse was so much galled, that it could no longer carry its load, and in consequence I was obliged to hire another from a person whom I met going up to Icó with loads of salt, and who had some spare animals

with him. The weather being fine, I preferred taking up my quarters under the shade of a broad-spreading wild fig tree standing some distance from any habitation, although I was invited by the owner of one of the houses to accept the accommodation it afforded.

As the person whose horse I had hired could not leave till the following day, I was obliged, against my will, to await his convenience. Soon after my arrival I sent Pedro to purchase some milk for breakfast, and he returned with a large basinful, for which he said the people would not take money; and in the course of the forenoon I had similar presents sent to me from two other persons. During the season of the rains, and for a few months afterwards, milk is very abundant, and of excellent quality, but it is nowhere to be procured except in large towns, during the last four or five months of the dry season. The inhabitants prepare a little cheese, but have no idea of making butter; the milk remaining after breakfast, for they milk their cows only in the morning, is allowed to stand till night, when from the heat of the day it becomes curdled; this dish of which they are very fond, is generally sweetened with a kind of coarse unclarified sugar, to which they give the name of *Rapadura*, and which is brought from the country above Icó; it is formed into cakes about six inches long, three broad, and two thick; during a long time I was obliged to use this as a substitute for sugar, but although at first not very agreeable, I at length became so fond of it as to prefer it to sugar itself, and such I found to be the case with the people in this part of the country; I have repeatedly seen them make a meal of a lump of this with a little

farinha. The greater part of the inhabitants of the district through which we were journeying, are rearers of cattlè (*Criadores de Gado*), but none of them possess such immense herds as I afterwards found to exist in the provinces of Piauhy and Goyaz. Provisions were here very cheap, in consequence of the small demand for them; an ox could be purchased for about twenty-five shillings, and a sheep or a goat for four or five; Pedro bought a fowl in fine condition for about two pence halfpenny, and eight eggs for a penny. I observed very few cotton plantations, as these people grow it only for their own use; they also cultivate a little mandiocca, the root of which produces a kind of cassava, well-known all over Brazil under the name of farinha; this, together with dried beef (carne secca), forms their chief food; the farinha is either used in its dry state, when it is much of the consistence of saw dust, or is made up into a kind of pudding called Pirão, by mixing it with boiling water, or with milk when that article is abundant.

On the first day's journey with our new companion we travelled about seven leagues, five of which were accomplished in the morning, and two in the evening. The Villa de Icó is in a southerly direction, bearing a little to the west of Aracaty, the distance between them being about two hundred and forty miles. The Senhors Pinto accomplished the journey in five days and a half, but it took me three days longer; which delay I did not regret, as I travelled more at my ease, and was enabled to make collections by the way, that I could not have done had I accompanied them. On this day's journey I observed that the country was gradually rising; where visible, the

soil consisted of a reddish coloured clay, but many large tracts were covered with gravel, which gave them the appearance of having been at one time the bed of an immense river. In other places beds of gneiss, forming elevated ridges were seen cropping out, the strata being nearly vertical. About half an hour after we began our journey, we passed a large lake on the left side of the road, called Lagoa grande; it is about a league long, and nearly as much broad, and abounds in fish and wild duck. Carnahuba palms were now becoming less frequent, but they were succeeded by a vegetation of a very opposite character; in situations somewhat sandy, a dwarf kind of *Cassia* often occurs, as well as two or three species of *Croton*, but these, in common with the herbaceous vegetation, were already much scorched up; in the gravelly places the principal production is a beautiful erect species of *Evolvulus* about a foot high, with small leaves and numerous blue flowers, giving it much the appearance of the common flax. On the more elevated tracts, woods are seen consisting of low trees and shrubs, principally a subarboreous species of *Mimosa*, and a *Combretum*; these woods are nearly all deciduous, the heat and drought producing the same effect on their foliage, as the cold in northern regions, these are called by the inhabitants *Catingas*; no large trees are to be seen, but in the more open parts of the country, a low wide-spreading species of the *Chrysobalanaceous* tribe is not uncommon, affording shade not only to travellers, but to the cattle which pasture in those districts; it was under one of these trees that we halted during the heat of the day, and dined on part of a large green lizard that I shot the evening before.

The remainder of our journey was through a country very similar to that just described; but a low evergreen *Zizyphus* tree, and a few large species of *Cactus* now gave a different character to the landscape. On the afternoon of the 12th the appearance of the country was still further diversified by our approach to a mountain range about sixteen leagues in length, running in a direction from S.W. to N.E.; this is called the Serra de Pereira, a name derived from the number of trees of that name said to grow on it. The appearance of this high land was a great relief to the eye, after having been so long accustomed to a nearly level country. On the same evening I saw for the first time a troop of oxen with loads on their backs; there were about a dozen of them, all large and well fed animals, going down to Aracaty with dried hides; such a sight was afterwards not uncommon. The further we proceeded inland, the greater appeared to be the effect of the drought; and in consequence of this I added but little to my botanical collections; but among the few plants that were in flower I observed a very fine species of *Angelonia* (*A. biflora*, Benth.) bearing long spikes of large blueish coloured flowers, and which is now common in English gardens, raised from seeds which I sent home. So little are the birds here annoyed by man, that flocks of pigeons of various sorts, parrots, paroquets, &c. remained without stirring on the branches of the small trees under which we passed; and cranes of different species as well as many other water birds, did not move from the margins of the small lakes till the horses nearly approached them; the same was nearly the case with two kinds of ravens, called by the inhabitants Gavião and

Gavião vermelho; these latter exist in great numbers living upon what carrion they pick up. While we were resting during the heat of the day, I frequently took my gun to shoot parrots and pigeons, which we stewed for dinner, and were more relished than our usual fare of dried beef, although the flesh of parrots is both brown, dry, and tough. Some of the pigeons, as before observed, are not larger than sparrows, and one of these which frequently alights on the roofs of houses, may be heard, particularly during the morning, calling out most distinctly "Fogo pegou, Fogo pegou" for hours together; in Portuguese this means "the gun missed fire," an apparently teazing exclamation of the bird, not unaptly applied to the clumsy guns of the country people which seldom take effect. This I suspect is the same bird that Waterton speaks of under the name of "Will-come-go." Shortly before we reached the Villa de Icó, we met a party of ladies and gentlemen, on horseback, and I was not a little surprised to see the manner in which the former were mounted, *au cavalier*, which, in nine cases out of ten, is the way in which females travel in the interior.

On my arrival at Icó my friends the Pintos had kindly procured an uninhabited house for my reception; in consequence of the breaking down of the waggon which was bringing up my trunks, &c., and other unforeseen causes, I was detained at this place three weeks, which I the more regretted, as my time could be turned to no useful account, in consequence of the drought that prevailed in the neighbourhood. The town of Icó, one of the most important in the interior of the province of Ceará, is situated in a plain on the east of the Rio Jaguaribe, which here,

however, takes the name of Rio Salgado; it is said to contain about 6000 inhabitants; the plain is one of considerable size, being bounded on the east by the Serra de Pereira, and on the west by a much lower range of hills. The town consists of three principal streets, running nearly north and south, intersected by a number of smaller ones. The houses are all built of brick, no timber of sufficient size being found in the neighbourhood; with the exception of about half a dozen, they are all of one story, and white-washed with a kind of chalk found abundantly in the hilly country thirty leagues to the westward. The principal street is broad, and contains some well-furnished shops; it presents four handsome churches, a substantial jail, and a market place, in which fresh beef, dried beef, farinha, salt, rapadura, gourds, pine apples, melons, water-melons, oranges, and limes, are every day exhibited for sale; the whole of these fruits are brought from a distance, the immediate neighbourhood of the town producing nothing whatever, the whole country being dry and arid, except during the wet season, which only lasts about four months. At a short distance are seen a number of those low deciduous woods called *Catingas*, but even these were destitute of leaves, and there was nothing within sight deserving the name of a tree; the river also, which during the rains is of considerable size, judging from the appearance of its bed, was now dry in many places, deep pools only being left here and there, abounding with several sorts of fish, which, however, are soon exhausted. Notwithstanding the number of inhabitants which this place contains, it cannot boast of a single medical practitioner, but there are two

apothecaries, whose shops are well stocked with medicines. The greater part of the inhabitants are shopkeepers, who supply the interior with articles of European manufacture, receiving produce in return, which they send down to the coast.

A few days after I arrived here I was visited by most of the respectable inhabitants of the place, and as their calls were shortly returned, I soon gained an extensive acquaintance. One of my most frequent visitors was an old priest, who was very inquisitive regarding all that related to England; one of his first questions was whether I was baptized or not, and in what faith? and when I told him I was a Protestant, he replied, "Ah! then you are a Pagan." Such was his ignorance! and this I found to prevail with nearly all the inferior priests I met in the interior of the northern provinces, and I had great difficulty in convincing him that the fundamental principles of our respective religions were alike; after this, whenever I was interrogated as to my religious faith, I answered by simply saying I was a Christian, which entitled me to respect. When it became known that I was a medical man I had numerous applications for advice. The most common complaints here, as elsewhere in Brazil, are chronic disorders of the digestive organs, which often terminate in dropsy and paralysis; dysentry, pleurisy, and ophthalmia are likewise not unfrequent, particularly during the dry season, produced, no doubt, by the great difference of temperature between night and day, which more readily takes effect on these people owing to the very thin dresses which they wear; in no case did I see flannel worn next the skin, which is the best preventive

against sudden change of temperature. One of my patients was the lady of one of my Portuguese friends, who was attended by her mother, and although her complaint was a dangerous malady of which she afterwards died, the greatest source of regret her parent expressed was the state of leanness to which her daughter was reduced, plumpness being considered the chief point of beauty in the Brazilian fair. One of the greatest compliments that can be paid a lady, is to tell her that she is becoming daily fatter and more beautiful (*mais gorda e mais bonita*), indeed the greater portion of them soon acquire a tendency to become so, from the sedentary life they lead.

After remaining about a fortnight I made preparations to leave Icó, as I wished as soon as possible to get up to Crato, another town about one hundred and twenty miles to the S.W., situated at the foot of the mountains which divide the provinces of Ceará and Piauhy where I was assured I should meet with abundance to reward my researches, as the general temperature was much cooler, and the country well watered with small streams from the mountains. I purchased two additional horses, engaged an experienced guide, and procured whatever was necessary for the journey, when the following incident occurred to prevent my departure. The day before that fixed for our journey, one of my new horses disappeared from the pasture in which it was feeding, if, indeed, a little dried up grass could be so called; as horse-stealing is a very frequent crime in Brazil, I strongly suspected that some one had made free with my animal, but I was assured it had only strayed into a neighbouring *Catinga* and would soon be found. I immediately despatched

Pedro and another man well acquainted with the country, in quest of it, but after two days search they could bring me no satisfactory tidings. Having lost all hopes of regaining it, I was about to purchase another, when a man, who had been searching for two of his own stray animals, told Pedro he had seen one answering the description of mine on the Serra de Pereira, about three leagues distant; upon this Pedro and his companion were again despatched in that direction, when they returned in the evening bringing it with them; they found it on an elevated table land feeding along with an immense number of the American Ostrich (*Rhea Americana*). This was the first of a series of annoyances I met with during my future travels, from my horses either straying or having been stolen; an animal is frequently taken away by some one who wishes to make a short journey, so that after a day or two it will be found in the place whence it was taken; at other times they are removed and hidden for a few days, for the purpose of claiming a reward; and though I was frequently well assured of this imposition, I never refused to pay the money, knowing I should otherwise be worse off. All being now again ready for leaving Icó, I took leave of all my friends, who gave me their hearty wishes for a prosperous journey. The evening before my departure many little presents were sent for my use during the journey, such as little jars of sweet-meats, biscuits of various sorts, prepared from ground rice and Indian corn, roasted fowls, &c.; a custom I found to be almost universal in the north of Brazil.

On the evening of the second day after leaving Icó, we arrived at the Villa de Lavra de Mangabeira, which is

about ten leagues distant. A little beyond Icó the road becomes very rough, frequently ascending and again descending over rocky paths, on which account it is no longer serviceable for the transit of waggons, all farther traffic into the interior being now effected either on horseback or, strange as it may appear, upon oxen. The diversity of hill and dale renders this part of the journey less mountainous, and although the herbaceous vegetation was much destroyed by the heat, the greater part of the trees, which are both large and more numerous, still retained their leaves; the most abundant tree that I observed was called by the inhabitants Aroeira; it is a species of *Schinus*, perhaps *S. Aroeira*, St. Hil. and reaches to the height of thirty or forty feet; as the stem grows very straight it is much used in house-building; at this time it was destitute of leaves, but from the ends of its branches were suspended clusters of small fruit of a dark colour, giving it very much the appearance of the European alder when covered with its dark-brown catkins. The other trees consist chiefly of large *Acacias* and *Mimosas*, *Bignonias* of considerable size covered with yellow and rose coloured flowers, a *Triplaris*, and, the most beautiful of all, a large *Jacaranda* the wide-spreading branches of which were densely covered with great panicles of beautiful large blue flowers, not unlike those of the no less splendid *Gloxinia speciosa*; among these sometimes appear a few solitary Carnahuba palms, but in hollow sheltered places they often occur in groups; large *Cacti* are not uncommon, and we passed over some elevated open shrubby tracts abounding in a species of *Krameria*.

The Villa de Lavra de Mangabeira is situated on the

banks of the Rio Salgado, and contains about eighty or a hundred houses, all small, and many of them falling to decay. Gold is found in the neighbourhood, in a dark coloured alluvial soil a little below the surface; from time to time washings have been established, which have never yielded satisfactory results; the most extensive of these was undertaken about two years before my arrival. The President of the province and some others having formed themselves into a company, sent for two English miners to conduct the operations; they continued their labours to within two months previously, when the work was abandoned. About a year afterwards I met with one of these miners in a far distant part of the country, and from him I learned that the gold exists in too small quantities to repay the cost of its extraction; scarcity of water at times was also another drawback. Here I found, growing in vast quantities on the sandy margins of the river, a species of *Grangea,* which is a powerful bitter, used by the natives as an infusion in dyspeptic cases in the same manner as chamomile, which, indeed, it much resembles, and to which they give the same name (*macella*).

We left Lavra on the afternoon of the same day on which we arrived, and halted for the night at a small house near the river. On the following morning as we were advancing quietly, one of the horses struck its load against a tree, by which means it was thrown off; thus disencumbered it ran away at full speed among the trees, and was soon followed by the remainder, who in like manner quickly rid themselves of their cargoes; an hour was thus lost in recapturing and replacing the loads, and

even while this was doing, one of the animals laid down and began to roll, first breaking the cords by which his burden was held on, and thus a second time freeing himself. I mention this, as an instance of one of the many annoyances to which a traveller in such countries is liable; in these respects horses are more unmanageable than mules. In the northern provinces of Brazil, however, the latter animals are very seldom seen, notwithstanding they have been frequently tried, large troops of them having been brought from the south. All being finally arranged, we continued our journey, and about mid-day arrived at a house on the bank of the river, near the roadside, where I asked permission as usual to pass the middle of the day, but we were told we should meet with better accommodation half a league farther on; this was the first time I met with a refusal, and I can only recollect one other similar instance during all my travels. After proceeding about a league without the appearance of any house, we halted under some large trees close to the river, where I determined to remain for the night, as the horses had undergone a long morning's journey. In the evening I took a walk in the neighbourhood, but met with nothing new except a species of *Mikania* clinging among the branches of a *Mimosa*; and a few shells in the bed of the river. Between this place and Lavra, the course of the river is very tortuous, and being now very nearly dried up, I observed that the inhabitants had planted melons, watermelons, gourds, &c. in it; bananas were now beginning to be cultivated, and almost every house had its own little cotton and tobacco plantation. Every where *Argemone Mexicana*, the Cardo Santo of the Brazilians, grows

in great plenty, the large yellow poppy-like flowers being very beautiful; a handful of the leaves of this plant, together with about a quarter of an ounce of the ripe seeds infused, is used as a draught in jaundice. It was a beautiful evening when I retired to my hammock, which was suspended between two trees, but I had not been long asleep when I was awoke by a strange rattling noise among the trees, that I soon found to be caused by a heavy shower approaching from the south, which very shortly fell upon our encampment in torrents; we were unprepared for such an occurrence, it being then the height of the dry season, and were quickly drenched; my hammock soon became too uncomfortable to lie in, so I got up, wrapt myself in my poncho, and sat down on one of the pack-saddles by the extinguished fire; I unfortunately had no umbrella to afford any shelter, having lost it two days before, at a place where I had dismounted to collect some beetles. The rain continued for about two hours, and not being able to go to bed again, every thing being soaked, I was obliged to remain seated in this position till daybreak, when, after arranging all our humid articles in the best manner, we proceeded on our journey. The morning though cloudy was dry, and there was a feeling of freshness in the atmosphere such as I had not felt since we left the coast; we travelled for nearly a league before we came to a house, so that instead of being only half a league distant from where we were refused accommodation on the previous day, I found it was nearly two; we went on two leagues farther, without meeting another habitation, so we halted during the middle of the day beneath some large Jatobá (*Hymenæa*) trees. This

part of the country is very thinly populated, the greater part of the soil being of a gravelly nature, is neither adapted for cultivation, even were water abundant, nor for feeding cattle. It is besides very hilly, some of the ranges being the highest we had yet passed over; from the top of one of the elevations I obtained a fine view of the undulating thinly-wooded country below; scattered here and there were to be seen large pink or yellow *Bignonias*, or the azure-blossomed *Jacaranda*, raising their magnificent diadems above the other denizens of the wood; and an occasional plant of *Cochlospermum serratifolium*, loaded also with its large and beautiful yellow flowers, attracts the attention of the traveller. The rocks which I observed during this ride were of a grey coloured clay-slate.

We had not travelled more than half a league in the afternoon, when we were again overtaken by rain, and although the shower lasted but half an hour, it was so heavy, that in a short time water was rushing over the roads, running like streams, and where they were of a clayey nature, especially on the declivity of the hills, they became very slippery. Having carried my poncho beneath my saddle, I put it on, when my appearance caused no little astonishment to some countrymen who passed us, that article of dress being quite unknown among them. It is, however, far superior to their leathern jackets, which are not only uncomfortably warm, by confining the natural exhalations from the body, but soon become soaked in case of rain, and are long drying, whilst with the poncho and my long boots I was nearly dry when the rain ceased. The rocks seen in the latter of part this day's journey

were a rather coarse-grained white sandstone, similar to those I met with on the coast between the Rio de San Francisco and Pernambuco. In many places this rock was exposed to a considerable extent, its only vegetation being a few species of *Cactus* and *Bromelia*. In the wooded portions, the atmosphere was loaded with the rich perfume of the flowers of the Cashew tree (*Anacardium occidentale*), which grew in great profusion. This was the first time I met with this tree at any distance from the coast, but I afterwards found it was not uncommon in the interior. The fruit, however, or rather the thickened peduncle which forms the esculent part, is small, not being much larger than a cherry. Towards dusk we halted at a place where there were two houses, but we could not be accommodated in consequence of two large troops having taken up their quarters before our arrival. As the next habitation was nearly two leagues further, and as the roads were said to be bad, I decided on remaining here and encamping under a wide-spreading *Cæsalpinia* which grew close by the roadside. Shortly after I had arranged everything for the night, a permission came from one of the houses to sling my hammock there, but I declined this invitation, not considering it prudent to separate myself from my luggage; this step was rendered the more necessary in consequence of a quarrel between Pedro and the guide; the latter was recommended to me as a very useful person for the journey, but he turned out to be a lazy talkative fellow, quite the reverse of Pedro, who was both active and intelligent. The quarrel originated from the guide refusing to attend to some duty while the horses were being unloaded, and, notwith-

standing my interference, it ran so high that they threatened to stab each other, the usual way of settling disputes in this lawless country; on taking the horses to pasture they were still talking furiously, and I felt not a little uneasy till they returned. The evening was dark and had all the appearance of rain, but when the moon rose, it cleared up, and became a beautiful night. My hammock and poncho were both too wet to sleep in, so I had to lie down on the top of two trunks for my bed, with my saddle for a pillow, near a large fire we had previously kindled.

On the following morning, the eighth of September, we continued our journey, and at eleven o'clock halted under some trees by the river side. Our route was through a richer country than any I had yet seen in the province, it being well wooded with large trees, the greater part of which were in leaf; near the houses, which appeared more numerous than hitherto, grew large plantations of cotton, tobacco, sugar-cane and mandiocca. On the branches of a large tree by the road side I collected the first Orchideous plant I had seen during the journey; a long round-leaved kind of *Oncidium*. The tree on which it grew was the Umari (*Geoffroya superba*), but only on the under side of the branches, the long leaves hanging down like so many whips, intermingled with its large panicles of yellow flowers. It is called by the natives of the Sertão "Rabo de Tatú," from the resemblance of the leaves to the tail of the Armadillo. Shortly after we halted, I went out with my gun in search of something for dinner, but could find only Parroquets, which were very numerous, flying from tree to

tree, and keeping up an almost continued cry of Parroquet—Parroquet. I fired at some which were seated on a tall tree, and one of those which fell being only wounded, kept up a continued scream whenever I attempted to approach it; this being heard by its companions, several hundreds of them again returned to the tree, and having once more fired among them, they were again brought back by the screams of the dying, nor did they cease to re-appear in the same manner till I had killed more than was sufficient for us all to eat. On the afternoon of this day we travelled about two leagues, and rested at a small sugar plantation, (Engenho de Rapadura). It being the day of San Gonzalvo, the people were dancing and making merry before the house; I obtained leave from the owner to let me pass the night in the mill, two sides of which were open. On alighting from my horse I laid down my straw hat, containing a silk pocket-handkerchief, on an old log of wood, close to the owner of the mill, but in less than half an hour afterwards, when all my things had been moved inside the boiling house, the handkerchief had disappeared: no one except my own men and the proprietor had been near us, so that I had every reason to believe the latter had pilfered it, but I did not think proper to take notice of it. This was not the only theft committed here before the morning, for when the horses were being loaded, Pedro discovered that a sack containing my large botanical tin box, and a sheep-skin bag, containing all belonging to him, were not to be found; it had been taken away from my luggage close to my hammock, while we were asleep. The poor fellow, as might be expected, was greatly annoyed at his loss, and

it was fortunate, that previously to leaving Icó I had removed a number of my most useful articles from the box to one of my trunks; I had just discovered my loss, when the owner came down to consult me concerning a complaint under which he laboured, but I was too much exasperated to accede to his wishes; he expressed much regret for our loss, and said it was the first time any traveller had been pilfered who had put up at his house. We had not proceeded on our journey more than a quarter of a league, when Pedro told me he would return to the mill and endeavour to recover his clothes, from which I could not dissuade him; the guide and I, therefore, went on alone, and at a distance of three leagues, halted under the shade of a large tree near some small houses. Pedro returned at two in the afternoon bringing his bag with him, and my botanical box, but not the handkerchief; upon his arrival, he took me aside, and told me that just before returning in the morning, a thought struck him that our guide might have been the thief, and if so, that the things would be hidden somewhere near the sugar-mill; it was this conviction that induced him to return, and the result proved he was right, for, after an hour's search, in which he was assisted by the people of the place, he discovered my box hidden among some bushes, and his bag buried under the earth at a little distance. I have no doubt that the guide was the thief of all the articles, and had hidden them until his return to Icó. He looked rather confused when Pedro returned, and my first thought was to give him an immediate dismissal without payment, but upon reflexion I resolved to take no notice of the matter, knowing the revengeful nature

of these people; I was sorry however, for the incautious manner in which I had treated the proprietor of the mill. The large tree under which we rested was the first I had seen of a kind that is very common about Crato; it is called Visgeira by the inhabitants, and is the *Parkia platycephala* of Bentham; it has a very thick stem, and wide-spreading branches, which in some instances nearly reach the ground; the wood is soft and brittle, and consequently not of much value.

On the same evening, after a journey of two leagues and a half we reached Villa de Crato; the road all the way was level and sandy, the country on the south side was well wooded with large trees, while the north, which is much flatter, was principally planted with sugar-cane, and several houses were seen at very short intervals, each with a mill and a boiling-house attached to it, for the purpose of converting the juice of the cane into Rapadura. The Carnahuba is here replaced by another kind of palm called Macahuba (*Acrocomia sclerocarpa*, Mart.), which rises to about the same height, but has pinnated leaves, and a stem which instead of being of the same thickness throughout, swells out considerably above the middle, and is exactly the same species as one very common about Pernambuco; along with this grows another species much resembling the cocoa-nut in its height and foliage, but with a much thicker stem; the nuts which are about the size of apples, are produced in large clusters; it is a species of *Attalea*, and is here called Palmeira. It is impossible to express the delight I experienced on entering this comparatively rich and smiling district, after a ride of more than three hundred miles through a country

which at that season was little better than a desert; the evening was one of the most beautiful I ever remember to have seen, the sun was setting in great splendour behind the Serra de Araripe, a long range of hills about a league to the westward of the Villa, but the freshness of this region seemed to deprive its rays of that burning heat which shortly before sunset is so oppressive to the traveller in the lower country. The beauty of the night, the cool and reviving feeling of the atmosphere, and the richness of the landscape, so different from what I had lately seen, all tended to produce a buoyancy of spirit such as only the lover of nature can experience, and which I vainly wished might prove enduring, as I felt not only at ease with myself, but "at peace with all below".

It was dark before we entered the Villa, but I soon found the house of a respectable shopkeeper, Senhor Francisco Dios Azede e Mello, to whom I brought letters of recommendation. I was requested to enter the sitting room, where I found myself in the midst of more than a dozen ladies, all squatting on the floor on mats, and among them was the lady of the house, who, as usual, put many questions to me respecting myself and my country; I discovered that these visitors had come to condole the lady on the loss of her husband's father, who had died on the previous day. Although within the more respectable houses in the Sertão, as the interior is called, chairs are to be seen in their principal room, they are seldom made use of, as the hammock (rede) is the favourite seat of the women, who are seldom out of it except at meal-time; in it, as upon the mat, they sit upright with their legs folded beneath them, and their principal occupation

during the day is smoking, eating sweetmeats and drinking cold water; it is generally slung so as to reach within about a foot and a half of the ground, when it answers all the purposes of a sofa, and often more than one person may be observed seated on the same hammock; at night it is commonly preferred to a bed, for which purpose, on account of its being much cooler, it is very generally used, and for which I can vouch from my own experience, as for three years I seldom slept out of one. They are generally made of a sort of strong cotton cloth manufactured by the inhabitants, and are either white, or white and blue, this colour being given by a dye which they prepare from a kind of wild indigo plant that grows abundantly in the neighbourhood; they are always made broader than long, which allows a person to lie in them diagonally, and hence more horizontally than if they were narrower; they have the advantage, however, of requiring no bedding, further than a thin blanket for a covering in the cool season, or a sheet in hot weather. Before I left Icó, one of the Pintos wrote to Senhor Mello asking him to procure a house for me on my arrival in Crato, but the only one he could obtain was a little dwelling attached to a shop, neither being in very good condition: however, it answered my purpose very well for the time, but I was obliged to look out for another residence in about six weeks, when it was required to be pulled down, in order that a new one might be erected in its stead; with some trouble I found two rooms which I hired at the rate of about five shillings a month, and where I remained till I left the place. My only furniture consisted of two chairs which Senhor Mello had the kindness to send me, an old

packing-box that served as a table, and of course my hammock was my bed. The day after my arrival in Crato a report was spread through the town that I was a travelling merchant who had arrived there with goods for sale, and in the course of the day I had numerous visits from ladies who wished to look over my merchandize, and who were not a little astonished when I told them I had none; this was not the only time I was mistaken for a merchant, indeed after leaving Crato the same mistake occurred at almost every house and village I arrived at, which is not surprising, as the number of people who travel in the interior from house to house, and from town to town, either selling European goods, or exchanging them for horses or cattle, is very great.

The Villa de Crato is situated thirty-two leagues to the S. W. of Icó, and nearly in the same parallel as Pernambuco, from which it is distant in a direct line about three hundred miles; it is a small and sufficiently miserable town, being about one third the size of Icó. It is very irregularly built, and the houses, with only one exception, are of a single story; it contains two churches and a jail, but one of the former has never been finished, and has remained so long in this state, that it has all the appearance of one that has fallen into decay. The jail is likewise in so ruined a state as scarcely to deserve the name of a prison, although there are generally a few criminals confined in it; it was guarded by two soldiers who performed their duty so easily, that in passing I seldom saw them otherwise occupied than either in playing cards or sleeping in the shade of the building; a serjeant who was confined during my stay in this place for disobedience

to his officer, was known almost every night to get out by one of the windows, which have only wooden bars, when after sleeping in his own house, he returned to spend the day in prison. The whole population amounts probably to about two thousand, the greater part of whom are either Indians or their mixed descendants; the more respectable portion of the inhabitants are Brazilians, who for the most part are shopkeepers; but how the poorer races gain a livelihood I am at a loss to determine. The inhabitants of this part of the province, who are generally known by the Indian appellation of Caryrís, are celebrated throughout Brazil for their lawless character; it formerly used to be, and still is, though not to the same extent, a place of refuge to murderers and vagabonds of all sorts from other parts of the country, and although it contains a justice of the peace, a Juiz de Direito, and other officials of the law, they possess but little power, and even if that little be exercised, they run great risk of falling under the knife of the assassin; several murderers were pointed out to me, who walked about quite openly. The principal danger to which they are exposed, is from the friends of the person they have murdered, who follow them to a great distance, and lose no opportunity of seeking their revenge. The state of morality generally among the inhabitants of Crato is at a very low ebb, card playing is the principal occupation during the day, when in fine weather groups of all classes, from those called the great people (gente grande) to the lowest, may be observed seated on the pavement on the shaded side of the street deeply employed in gambling; the more respectable generally play for dollars, the poorer either for copper

money, or more commonly make use of large spotted beans in lieu of counters; quarrels on these occasions are of course very common, which are not unfrequently settled with the knife. Scarcely any of the better class live with their wives: a few years after their marriage, they generally turn them out of the house to live separately, and replace them by young women who are willing to supply their place without being bound by the ties of matrimony. In this manner these people have two houses to keep up, among others who are living in this condition I may mention the Juiz de Direito, the Juiz dos Orfãos, and most of the larger shop-keepers; such a state of immorality is not to be wondered at, when the conduct of the clergy is taken into consideration, the vicar (vigario), who was then an old man between seventy and eighty years of age, is the father of six natural children, one of whom was educated as a priest, afterwards became President of the province, and was then a senator of the Empire, although still retaining his clerical title. During my stay in Crato he arrived there on a visit to his father, bringing with him his mistress, who was his own cousin, and eight children out of ten he had by her, having at the same time five other children by another woman, who died in child-bed of the sixth. Besides the vigario there were three other priests in the town, all of whom have families by women with whom they live openly, one of them being the wife of another person.

I lived about five months among these people, but in no other part of Brazil, even during a much shorter residence, did I live on less terms of intimacy with them or make fewer friends; besides Senhor Mello, the only indi-

vidual whose house I visited frequently, was another son of the old vicar, Capitão João Gonzalvez, who was the proprietor of a sugar (Rapadura) plantation, about two leagues below the town. I first made his acquaintance from his having consulted me about his wife, who was labouring under chronic ophthalmia; he was a man of an amiable and excellent disposition, and I still look back with pleasure on the hours spent in his house. The eyes of the lady improved much under my treatment, and as she was very communicative and good-natured, we had many long conversations about the manners and customs of our respective countries. The family consisted of two daughters, one of whom was married, and lived at a place I afterwards visited about sixteen leagues distant; the younger one, a fine girl about sixteen years of age, was very shy in making her appearance, so that I did not see her during my first two or three visits; but as her mother afterwards told me, her curiosity to see and speak with an Englishman, at length completely got the better of her reserve, so that afterwards she always appeared when I was there. She was then about to be married to a younger brother of her sisters husband, having been betrothed to him for many years: it is indeed seldom that the daughters of respectable families are allowed the power of choosing a husband for themselves, the parents always taking care to make the arrangements in such cases.

At this plantation I had often an opportunity of seeing the manner in which Rapadura is made; the expression and boiling of the juice are performed at the same time; the mill is of very clumsy construction, consisting of a

frame-work containing three vertical wooden rollers through which the cane is passed to express the juice, which is collected in a receiver below, where it runs into a trough that had been hollowed out of a large tree. The cane requires to be passed three times through the mill before the whole of the juice is expressed: from this trough a portion of the juice is conveyed from time to time into small brass boiling pans, of which there were nine, all placed close beside each other over small openings in the top of an arched furnace, and during the different stages of the operation, as the evaporation proceeds, the juice is poured from one pan into the other, till in the last it acquires the desired consistency; it is then transferred into a large tub, hollowed out of solid wood, called a Gamella, and is allowed to cool for some time, when it is finally run out into wooden moulds about the size and shape of our common bricks, although some are made about half this size; after being removed from the moulds, they are allowed to harden for some days, when they are fit for the market; the larger size sell at Crato for about a penny each, in Icó for three halfpence, and in Aracaty for twopence each.

Sugar-cane, mandiocca, rice and tobacco are the principal articles cultivated in Crato. The ordinary tropical fruit trees grow in and around the town, such as the orange, the lime, the lemon, the banana, the mango, the papaw, the jack, the bread-fruit, and the cashew; grapes, pine-apples, melons and water-melons, are also commonly cultivated, these fruits are sold very cheap, thus, oranges a penny per dozen, pine-apples, large and of a fine flavour, two-pence each, and large melons may be had at the same

price. The country gradually rises from Crato towards the S.W. till it reaches the base of the Serra de Araripe, an elevated table land forming a semicircle round the undulatory plain in which the town is situated; this Serra is from one and a half to two leagues distant from Crato, and from the numerous springs that rise from its base, may be attributed the great fertility of this part of the Sertão, the small streams from which are diverted in a thousand directions for the purpose of irrigation. At present but a small portion of this fertile district is cultivated, although it would amply repay such labour; the vicinity being but thinly populated, and the habits of the natives extremely indolent; with very little trouble they can raise all that is necessary to support life, and seem to care for nothing beyond this. Their dress is of the most simple description, and consequently not expensive; when however, the population becomes more numerous, and civilization shall have multiplied their wants, this district will assuredly prove a rich and valuable part of the province; the greatest drawback to it is the want of any other than land communication with the coast. The union of the little streams which flow from the Serra de Araripe forms a rivulet that passes close to the town of Crato, and affords an abundant supply of excellent clear water to the inhabitants at all seasons; it offers also some deep pools that serve as bathing places, a luxury in which they are very fond of indulging, especially during the hot season.

During my residence at this place I made many excursions in the neighbourhood, but the Serra de Araripe proved the best field for my researches, I spent several

days at different times, in exploring its ravines, sides and summit, every trip yielding me large supplies of new and rare plants. The greater portion of the wooded districts around Crato consists of deciduous trees and shrubs, forming what are called Catingas, but in low moist localities, and along the base of the Serra, a great many of the trees are evergreen; one of the most common denizens of the Catingas is the *Magonia glabrata*, St. Hil., which is here truly gregarious, covering large tracts for miles to the exclusion of almost everything else; in general it is a tree from thirty to forty feet high, but at full growth it often attains a much greater stature. Like many of the other inhabitants of the Catingas, its flowers appear before the leaves, they are in large panicles, of a greenish yellow colour, and of very sweet scent; it is called Tingi by the natives, who apply it to many useful purposes; an infusion of the bark of the root is employed to poison fish, and that of the stem to cure old ulcers. The fruit is a large dry triangular capsule filled with broad flat seeds, from the kernels of which a kind of soap is manufactured; the manner in which they make it is this; after having taken off the brown membrane which covers the seeds, they are put into a tub of water to steep for some time, when the cotyledons begin to swell and soften, the thin skin which still covers them is easily taken off, and they are then put into a pot along with a small portion of tallow; by boiling and stirring them they soon form a homogeneous mass, which, when cool, is said to answer very well for washing clothes. Another tree which grows in similar situations, is a species of *Caryocar*, that presents a fine appearance when covered with its large

corymbs of yellow flowers; the fruit, which was not ripe during my stay, is said to be excellent when cooked, and its hard wood is of great use as timber in the construction of mills. The Visgeira, already mentioned, and the Timbahuba, are also two large trees of the neighbourhood, the latter belongs to the *Mimosa* tribe, producing large round heads of yellowish flowers, and a broad legume curved round so as to resemble a horse shoe. A kind of small deer that much frequents the woods is very fond of this fruit, and is often watched for at night at the season when the fruit falls, being discovered by the rattling noise which the seeds make within the pod when trodden upon. The Jatobá, a species of *Hymenæa*, is another large tree of common occurrence, as also the Angelim, a large and beautiful species of the genus *Andira*; two *Bignonias* of considerable size are also common in the distant woods, one with purple, the other with yellowish flowers, but owing to the durability and hardness of their timber, which is much sought after by the natives for the construction of mills and carts, they are not allowed to attain any great size near the town of Crato. Besides these there are many other trees of smaller size, among which may be mentioned the Pao de Jangada (*Apeiba Tibourbou*), and one of frequent occurrence, and conspicuous form its large prickly capsules; on the coast its wood affords the material for the raft-boats before described, so commonly in use there. A species of *Byrsonema*, a *Callisthene*, a *Gomphia*, and a *Vitex*, are all remarkably beautiful when in blossom. When planks are required in most, indeed I may say in all parts of the Sertão, there is a sad waste of timber, for to obtain one

an entire tree is chopped on both sides until it is reduced to the exact size required.

A number of wild fruits are found in the Catingas, among these are the Mangaba, already spoken of as very common about Pernambuco, the Guava, the Araça, and also, but only on the top of the Serra, a nearly allied species called Marangaba; it is the *Psidium pigmeum* of Arrudo, a shrub from one to two feet high, the fruit of which is about the size of a gooseberry, and is greatly sought after on account of its delicious flavour, which resembles that of the strawberry. The woods in the immediate neighbourhood of the town produce a fruit called Pusá, which belongs to a new species of *Mouriria* (*M. Pusá*, Gardn.), it is about the size of a small plum, of a black colour, and resembles very much in taste the fruit of the Jaboticaba (*Eugenia cauliflora*, DC.) of the south of Brazil; when in season it is brought to the town and carried through the streets for sale, by the Indians. The Cashew is also very common, but the eatable portion of the fruit is smaller and not so well tasted as that which grows along the coast.

One day, near the Serra de Araripe, I passed an encampment of Gipsies consisting of about a dozen men, women and children; these people are not uncommon in the interior of Brazil, for I either met with them, or heard of them in almost every town I visited; they are generally disliked by the common people, but are encouraged by the more wealthy, as was the case on the present occasion, for they were encamped beneath some large trees near the house of a Major in the national guards, who is the proprietor of a large cane plantation

at the foot of the Serra; although of a darker colour, they have quite the same features as the Gipsies of Great Britain, many both of the young men and women being very handsome; they seldom come near the large towns of the coast, preferring more thinly inhabited, and consequently more lawless districts; they wander from farm to farm, and from village to village, buying, selling and exchanging horses, and various articles of jewellery; like those of Europe they are often accused of stealing horses, fowls, or whatever they can lay their hands upon; the old women tell fortunes, in which they are much encouraged by the young ladies of the places they visit. Although they speak Portuguese like the other inhabitants of the country, among themselves they always make use of their own language, always intermarry, are said to pay no attention to the religious observances of the country, nor to use any form of worship of their own; they are called Ciganos by the Brazilians. Just about the time that the Gypsies made their appearande near Crato, one of my horses was missed from its pasturage, and it was strongly suspected they had carried it off, but in this instance at least, they were wrongly accused, for I have good reason to believe that the person who made free with it, was a Fazendeiro who was very anxious to purchase it from me only a day or two before it was stolen, just as he was on the eve of returning from Crato to his Engenho many leagues to the westward; as it had my own brand upon one of its hind legs, and as it was well known about the neighbourhood that it had disappeared, I was assured by the justice of the peace that it would ultimately be found, and he was right, for

about six weeks afterwards, it was found in a wood about three leagues from the town, but instead of being an animal in fine condition, it was now little better than skin and bone; the person who took it, was one Josè Pereira de Hollanda, a man whose character was not held in much estimation, and by whom it had been used to hunt down cattle on his estate.

During my stay in Crato the festival of our Lady of Conception was celebrated; great rejoicings were kept up for nine days previously, the expenses of which were defrayed by the different individuals appointed to conduct it; during the whole period of the Novena, as it is called, the few soldiers stationed in the town kept up an almost continued fire, both day and night; so that with this, and the processions, illuminations, and discharges of fireworks, and of small cannon in front of the church, the Villa was one continued scene of uproar. As the last night was said to be the finest of all, I went about seven o'clock to the church, before which a number of flags were flying on poles, and two large bonfires blazing; on the terrace before the sacred edifice, an immense crowd had assembled, and about half a dozen soldiers were from time to time discharging their muskets; at a little distance, a band of musicians were playing, consisting of two fifers, and two drummers, but the music they produced was of the most wretched description; there was also a display of fireworks, quite in keeping with the music. The church inside was brilliantly illuminated, and almost full, but I was surprised to see that nearly the whole of the congregation consisted of females, they were all dressed in white, or at least with a white kind of

mantilla over their head and shoulders. On the following day a little before dusk, a large procession, consisting entirely of men, passed through the various streets, figures of the Virgin and her Son being carried in great pomp; the three priests of the Villa, together with the Visitador, or deputy of the Bishop, who was then on his usual triennial tour through the villages and towns of the province, walked under a scarlet canopy. The whole affair was wound up on the succeeding afternoon (Sunday) by exhibitions on the tight-rope, and a dance of masqueraders, in front of the church.

The mean temperature of Crato is much lower than that of Icó, it is not considered so healthy as the latter place, for the heat during the day is nearly as great, although the nights are much colder. Ophthalmia is truly endemic, and, during some part of the year, few escape its effects, I had an attack which confined me to the house for several days. Many persons suffering from the disease in its chronic state, consulted me, and I gained no little reputation from having either cured or much alleviated the symptoms in most of the cases that presented themselves, even when the complaint had been of long standing; blindness is a very common result, and nowhere have I seen a greater number of blind people than in this district; secondary syphilitic complaints are also very common, and many are the miserable wretches which they have here produced; in such cases, mercury is very seldom employed for the primary symptoms, these being generally cured by a species of *Croton*, commonly known by the name of Velame; it is used both externally and internally with some effect, but under this

treatment sooner or later the secondary symptoms make their appearance, under some one or other of their protean forms. A residence of but a short time in the interior of Brazil, would soon convince those medical men who would cure these complaints without mercury, of the danger of such treatment.

CHAPTER VI.

CEARA CONTINUED.

Reasons for delaying journey into the Interior—Visits, meanwhile, different places in the Vicinity of Crato—Crosses the Serra de Araripe —Reaches Cajazeira—Arrives at Barra do Jardim—Description of that Town and Neighbourhood—Meets with an interesting deposit of Fossil fishes—Geological character of the Country—Detects a very extensive range of Chalk formation—First discovery of such Beds in South America — The accompanying formation described—This range of Mountains encircles the vast Plain comprising the Provinces of Piauhy and Maranham — Arrives at Maçape — Great religious Festival on Christmas day—Meets with an accident—Visits also Novo Mundo—Discovers other deposits of Fossil Fishes near these places—Vegetable productions along the Taboleira—Different Tribes of uncivilized Indians in that Neighbourhood—Curious account of the fanatical sect of the Sebastianistas—Their extravagant belief—Commit human sacrifices—Their destruction and dispersion—Returns to Crato.

I found on my arrival at Crato that it would be necessary to remain there longer than I had previously anticipated, owing to the desert state of the country, in the dry season, between it and Oeiras, the capital of the province of Piauhy, at which time water and grass are so scarce, that only those well acquainted with the country would undertake this journey; I was therefore strongly recommended to defer leaving Crato till the rains should set in, to which advice I was the more willing to listen,

finding that district a very good field for my botanical researches, and knowing well, moreover, that a journey to Oeiras at that time would yield very little. It was now the beginning of December, and the rains were not expected to set in till the beginning of February. Having pretty well exhausted the neighbourhood of Crato, I determined to visit in the interim a small town about sixteen leagues distant, called Villa da Barra do Jardim, being the more desirous to spend some time at that place in order to search for a deposit of fossil fishes which were reported to exist in the neighbourhood. My friend Capitão João Gonsalvez gave me letters to his relation Capitão Antonio da Cruz, the principal person in the place, and on the afternoon of the eleventh of December I left Crato. The road for the first five leagues runs nearly eastward along the Serra de Araripe, and after having accomplished four of them, we halted for the night about eight o'clock, at a little village called Cajazeira; on enquiring for a place where we might pass the night, it being then quite dark, we were directed to a shed used for the preparation of farinha, which besides being open all round, was but indifferently roofed; this, however, proved a better shelter than a large tree under which we first thought of encamping, for about midnight we were awakened by a tremendous peal of thunder that broke right over us. The storm continued with more or less violence for nearly half an hour, and was followed by a very heavy shower of rain, which caused me no inconvenience as my hammock was slung under a comparatively well-roofed part, although Pedro and the guide were soon obliged to change their quarters. On our arrival we found the vil-

lage illuminated with several bonfires, and there was also much firing and other rejoicings, occasioned by the presence of the Visitador who reached this place during the day, intending to proceed to Barra do Jardim on the following morning. It was seven o'clock before we could resume our journey, and in an hour's time we reached the foot of the Serra with the view of crossing it, but we first halted for a short time in order to take some breakfast, being informed that neither houses nor water were to be met with during the next eight leagues of the journey. At a distance of half an hour's ride from Cajazeira we met a number of well-dressed horsemen, one of whom finding on enquiry that I was the English Botanist about to visit Jardim, told me that his name was Gouvea; that he had heard of my intended visit from his friends in Crato, to which place he was then going, intending to return in the course of a few days. From him I also learned that his companions had come to meet the Visitador and escort him to Jardim; in half an hour's time they all passed us on their return, in company with the prelate, and soon afterwards the Visitador's troop overtook us, consisting of eight or nine horses, one of which was loaded with water for the journey across the Taboleira, as all elevated flat tracts are called in the interior. The water was carried in large leathern bags, and as I had not as yet provided myself with such an apparatus, I was contented with purchasing a number of oranges, and a few pieces of sugar cane, as very palatable substitutes, and on a short journey easily carried. The Serra is scarcely so high here as it is at Crato, but the ascent is very rugged, and in several places very steep. About half an

hour after we descended the Serra we passed the Visitador and his party, all lying under the shade of a large tree, eating the fruit of the Mangaba which grew abundantly around them; he kindly invited me to remain and partake of his breakfast, for which he was awaiting the arrival of his troop, but I declined his kind offer as I was anxious to cross the Serra without halting. It occupied a ride of nearly six hours to traverse this table land, which is perfectly level all the way; it is thinly studded with small trees, which give it very much the appearance of an English Orchard; the soil was thickly covered with long grass, which was now dried up like hay; in many places it had been set fire to, and large tracts burned, which I afterwards found to be a very common practice in the open campos of Brazil towards the end of the dry season, in order that after the first rains, a good crop of new grass may thus be obtained; it is, indeed, astonishing to witness the rapidity with which it then springs up. The vegetation on this Taboleira I found to be so very similiar to that on the top of the Serra at Crato, that with the exception of a single specimen of a shrubby species of *Cassia*, I did not meet with anything I had not before collected; on the ascent of the Serra, however, I found a new species of *Rollinia* in flower. It was not till we had reached nearly the extremity of the Taboleira, that I came in sight of the valley in which the Villa da Barra do Jardim is situated, from the rich and verdant appearance of which it takes the name of Jardim, or Garden. The Serra being lower on the south than on the north side, the descent is much easier, and the road is also better.

On reaching the Villa, which is nearly a league from

the foot of the Serra, I found that we had passed the house of Captain Antonio da Cruz, so that we were obliged to turn back half a league, and I felt annoyed for not having sooner made enquiries, as our horses were greatly fatigued after so long a journey, performed during the whole time under a burning sun. On arriving at the house, which is attached to his Engenho, I met with a kind reception from the Captain, as well as from his son, and the lady of the latter, who was the daughter of my Crato friend Captain Gonsalvez, with both of whom I had been previously acquainted during their visit to the latter place. My horses were immediately sent to pasture, and dinner prepared, for which I felt an excellent appetite after this long day's ride. Aware of my intended visit, they had kindly prepared an uninhabited house in the town for my reception, to which they would not allow me to go till the following morning after breakfast.

The Villa da Barra do Jardim lies south from Crato, bearing a little to the eastward, the valley in which it is situated being about a league in length, and in its widest part about half a league broad; the town is small, in the form of a large square, three sides of which only are completed, and nearly in the centre of this square stands its only church, also in an unfinished state. At the time of my visit the surrounding country was very much burned up, particularly towards the south, but on the north side of the town, towards the bottom of the Serra, there were many small plantations of cane, watered by small streams which take their rise in the Serra; without these the valley would then have been quite at variance with its name. Here, as around Crato, cane is the principal article culti-

vated, but in the neighbourhood of the Villa there are two or three very small plantations of coffee, for which the place, seems well adapted, judging from their vigourous appearance, and the large crops they were said to yield; the quantity raised in this neighbourhood is not, however, sufficient for its own consumption, what more is required, and, indeed, the whole that is consumed in other parts of the province, being imported from Rio de Janeiro. Upon asking several of the proprietors of cane plantations why they did not plant coffee in preference, seeing the much greater profit it would bring them, they all replied that, being accustomed to the making of Rapadura, they did not like to risk it for a system of cultivation with which they were imperfectly acquainted; but the principal cause, in my own opinion, is their lazy and indolent habits, and the great horror they entertain of any thing like innovation on the customs of their forefathers; were the country in the possession of an industrious people, this would, no doubt, become one of the richest districts in the north of Brazil.

Two days after my arrival, I paid a visit to Capt. Antonio da Cruz, where I learned that on a rising ground between his house and the Serra, there were often found rounded limestones, which when split, exhibited the remains of fishes; two of his sons accompanied me to the spot, where I made a collection of several species more or less perfect. The place where these were found was on the slope of a low hill about a mile from the Serra; the stone in which they occur, being an impure dark-coloured limestone; I found them of all sizes, but none larger than I could lift, all were more or less

rounded, having evidently undergone attrition. The place which they occupy is not above a hundred yards square, and in this extent scarcely any other kind of stone is found, but beyond it, the ground is covered in a similar manner, with rounded blocks of sandstone of the same nature as that which forms the mass of the Serra. Similar deposits exist along the base of the range, but all in isolated patches, as in the present instance. I have purposely deferred till now making any remarks on the geology of the district around Crato, but I must premise that the substance of what is here stated, is taken from a paper read by me before the Glasgow Philosophical Society, in April 1843, and which has since appeared in the Proceedings of that Society.

Nothing like chalk with its accompanying flints has yet been found on the continent of North America, but in New Jersey, Dr. Morton has described a deposit which he considers to be equivalent to the lower, or green sand beds of that formation, and to which he has given the name of 'The ferruginous sand formation of the United States." The fossil remains which it contains, proves the correctness of his opinion. As regards the South American continent, it is asserted by Humboldt, that it neither contains oolite nor chalk, from the fact that no traveller who has hitherto written on the geology of that immense continent, has ever met with either, it was therefore a source of no little satisfaction to me to find that I had been the first to discover, in the new world, the entire series of rocks which constitute the chalk formation, specimens of all of which I did not fail to collect.

The Serra de Araripe, or that which runs between Crato and Barra do Jardim, is only an eastern branch of an elevated table land which stretches continuously from the sea-coast, southward, and forms a natural boundary between the two great provinces of Ceará and Piauhy. It is generally elevated from 500 to 1,000 feet above the level of the country to the east of it, but not so much above that to the west; to this range, the name of Serra Vermelha is given by the Portuguese, and Ibiapaba, by the Indians. Between the 10th and 11th degrees of latitude, it takes a westerly direction, and in about 47° of longitude, takes a northerly sweep, finally terminating at the mouth of the River Amazon, under the equator, the country which it surrounds forming a valley of great extent, including the entire provinces of Piauhy and Maranham. This elevated range varies much in breadth, as many branches run off from it, both to the east and to the west; the top is nearly perfectly level, forming as before mentioned, what the Brazilians call, Taboleiras. The great mass of the Serra consists of a very soft, whitish, yellowish, or reddish-coloured sandstone, which in many places must be more than six hundred feet thick; and in this rock exist the nodules which contain the fossil fishes. The circumstance that first led me to suspect this rock belonged to the chalk formation, was, an immense accumulation of flints and septaria, similar to those of the chalk of England, which I found on the acclivity of the range, during a journey made along its base, to the north of Crato. I now began to inquire if anything like chalk was found in the neighbourhood, when I learned there were several pits in the Serra, whence the inhabi-

tants obtained it for the purpose of white-washing their houses; these pits I afterwards found to be situated in a deep layer of red-coloured diluvial clay, which lies immediately over the sandstone of the Serra. In a ravine near Crato, I endeavoured to ascertain the formation on which the sandstone rested, when I found it to consist of several layers of more or less compact limestones and marls, with a bed of lignite about two feet thick; upon what these rested I could not at that time ascertain, but sometime afterwards when I crossed to the west side of the range, I found these limestones existing upon a deposit of very dark-red coarse-grained sandstone, abounding in small nodules of iron-stone. Thus we find, that the structure of the rocks in this locality, is very similar to that of the chalk formation in England; there is

1st. A ferruginous sandstone deposit, equivalent to the lower green sand or Shanklin sand.

2nd. A deposit of marls, soft and compact limestones, and lignite, equivalent to the English gault.

3rd. A very thick deposit of fine-grained, soft, variously coloured sandstone, containing Ichthyolites, equivalent to the upper green sand of England.

4th. The white chalk itself, and flints occurring in pits partially covered by red diluvial clay.

Flints are very common along the foot of the Serra, to the N.W. of Crato, but none were found in any of the chalk-pits that I examined; I learned, however, that at a considerable distance to the north of Crato, at a portion of this mountain range, called the Serra de Botarité, both chalk and flints are far more abundant than they are near the former place, where they seem to have been almost

entirely washed away, previous to the deposition of the red clay in which it is now found.

Since the time when these rocks were first deposited at the bottom of the sea, to the present period, both they and the surrounding country must have undergone various changes with respect to elevation; but before making any observations on this subject, I will point out the various places where I have met with traces of the chalk formation, besides that just described. In 1838, during my voyage up the Rio de San Francisco, which empties itself into the Atlantic between the 10th and 11th degrees of south latitude, I obtained specimens of the rock on which the Villa do Penedo is built, and on comparison, these proved to be identical with those from the upper sandstone of Crato. In 1839, I found the ferruginous sandstone of Crato extending westward thence about 500 miles, and in the year 1841, I observed at Maranham, in 2° of south latitude, and 44° of west longitude, a formation very similar to that at Crato. The whole island on which the city of Maranham is built, consists of a very dark-red ferruginous sandstone; on the main land to the westward, the same rock was observed rising a little above the sea level, but immediately upon it, there exists a deposit, in some places more than 50 feet thick, of a yellowish and greenish coloured sandstone, very soft, and of a marly nature.

From these data, then, I think there can be little doubt, that the whole of that immense shoulder which forms the more easterly point of the American Continent, has at one time been a great depository for the chalk formation. The only other rocks that I observed in places

denuded of the deposits belonging to the chalk, are, 1st, gneiss and mica-slate, the layers of which crop out in nearly a vertical direction, as was frequently observed on my journey from the coast, and during my voyage up the Rio de San Francisco; and, 2nd, beds of grey coloured clay-slate, which I passed over about 18 leagues below Crato. The whitish coarse-grained sandstone that I met with immediately afterwards, is probably equivalent to the ferruginous sandstone, found on the west side of the range; from this it would appear, that between the cretaceous series, and the primary stratified rocks, there are no traces either of the carboniferous or the oolite formations, nor in any part of Brazil, through which I afterwards travelled, did I meet with any signs of them.*

We have already seen, that the country from the coast to Crato, is for the most part level, large portions being covered with coarse white sand, or gravel of various sizes, which give it the appearance of the dried up bed of an immense river; much of this gravel consists of flints, and intermingled with them are numerous boulders of various sizes, more or less rounded, consisting of granite, gneiss, and quartz. Whenever these gravelly tracts cease to

* Dr. Parigot appears, however, to have found coal abundantly in the Island of Santa Catherina, in the South of Brazil. He was employed by the Government while I was there, to explore that country for coal, and in a pamphlet which he published, in 1841, entitled "Memoria sobre as Minas de Carvão de Pedra do Brazil," he mentions a bed about three feet thick, of considerable extent; but as nothing has since transpired on the subject, it may be doubted whether this coal is of any useful quality.

The coal which Spix and Martius inform us exists near Bahia, Dr. Parigot found to consist of beds of lignite; and the probability is that they are equivalent to that which I found at Crato.

appear, the surface of the country is covered with a deposit of the same kind of red clay which lies over the upper sandstone of the table-land. To the westward of this table-land, considerable portions are covered with the variously shaped ironstone nodules, found in the ferruginous sandstone, and which have accumulated from the decay of that rock.

I have now to offer a few remarks on the changes of elevation which this part of the continent has undergone since the chalk rocks were first deposited; it is manifest, that deposition took place at the bottom of a shallow ocean, and it admits of no doubt, that at some subsequent period, it has been gradually elevated above the level of the sea; it is evident that this elevation has been gradual, from the horizontal position of the strata of which the deposit is formed; for had the elevating cause been sudden and violent, their original position would not have been so perfectly maintained. The first portion that emerged from the sea was probably the long elevated table-land, which for a period must have formed a neck of land separating the Atlantic Ocean on the east, from the great bay, which the immense valley to the westward must then have formed.

From some of the foregoing observations it is obvious that the chalk formation, at one time, must have covered a very great tract of the surrounding country, and we may very reasonably conclude that it was during the gradual elevation of the land, that the action of the waves of the ocean as gradually destroyed the soft material of which it had been fabricated. But long after this had been accomplished, and at a comparatively recent geological

period, the whole country seems again to have been covered with water,—not only the nearly level country between the shores of the present sea, and the elevated table-land, but even the highest parts of the table-land itself. This is proved by the thick stratum which exists on both, of a deep red-coloured diluvial clay, similar to that which I have observed to cover nearly the whole surface of Brazil, from the sea-shore to the summits nearly of the highest mountains, and which is often more than forty feet in thickness. When this is cut through, it is found to consist of various layers of clay and sandy gravel, in which are imbedded rounded stones of different sizes. These have evidently been deposited from water; and in that part of the country of which we are now speaking, this deposition of clay must have taken place at a period subsequent to the inundation of the country to the east and west of the table-land. This could only have been accomplished by the sinking of the land again beneath the level of the sea, which will account for the nearly total destruction of the white chalk, as well as for those small cones of it which remain imbedded in the red clay,—that deposit having been laid down before the whole of the chalk could be washed away; since then this part of the continent must have gradually emerged a second time from the bosom of the ocean.

Part of my collection of fossil fishes were sent to the care of my much lamented friend, the late J. E. Bowman, Esq., of Manchester, shortly after I found them; these were exhibited by him at the Meeting of the British Association at Glasgow, where they were seen by M. Agassiz, and although no specimens of the rocks ac-

companied them, he immediately, from their zoological characters alone, pronounced them to belong to the chalk series. It is well known that this learned naturalist divides all fishes into four great classes, from the nature of their scales; two of these, the *Ctenoid* and *Cycloid*, never make their appearance in any of the rocks beneath the chalk, and it was from his knowledge of this fact that he decided my specimens to be from that formation, as they consisted chiefly of individuals of the *Ctenoid* and *Cycloid* groups. The fishes are in a most perfect state of preservation, and, as I have already stated, are included in an impure fawn-coloured limestone; the blocks, however, in which they are preserved, are only nodules contained in the yellowish coloured sandstone. They have in general somewhat the form of the imbedded fish, and the carbonaceous matter was apparently aggregated round them by chemical attraction from the sandstone, while in a soft state; these nodules being harder than the sandstone, have, by its gradual decay, accumulated at various places along the acclivity of the range, and I possess specimens both from the east and west side of it.*

On the evening of the 23rd. of December I had an invitation from Lieut. Col. João José de Gouvea, a gentleman to whom I brought letters, to accompany him and the Visitador to a place called Maçapé five leagues to the east of the Villa da Barra do Jardim, whither they were going to pass Christmas Day. This I gladly accepted, having

* The fishes were found by M. Agassiz to be all new species, and he has described them in the 'Edinburgh New Philosophical Journal' for January, 1841. I also possess, from the same rocks, specimens of two species of very minute bivalve shells, a single valve of a *Venus* and casts of a univalve shell, all apparently new.

been already informed that a large deposit of fossil fishes existed there. We started at eight o'clock on the morning of the 24th, and as the Visitador was not to return, he was accompanied for nearly a league from the Villa, by about half a dozen of the most respectable persons in the neighbourhood, Senhor Gouvea, his lady, and Senhor Machado, and I went on to Maçapé. At about half a league from the Villa we entered a narrow ravine, wooded on each side with large trees, the branches of which were bearded with the long *Tillandsia usneoides*, and another large species of the same genus, but I did not observe a single Orchideous plant. This ravine is nearly half a league in length, and about the middle of it arises a spring yielding an abundant supply of cool and limpid water, which lower down is applied for the purpose of irrigation. As the ravine rises gradually, the ascent of the Serra here is less steep, than by the one we passed on the road from Crato. Immediately on entering the Taboleira the vegetation changes, none of the trees seen there being found below, but I did not perceive any difference from those already observed on other parts of it. After a very pleasant ride of four hours, we reached the opposite side of the Serra, where a vast difference appeared in the vegetation, compared with that of the vicinity of Jardim; here all was green and verdant, owing to several heavy showers that had fallen a few weeks before; the trees on the Taboleira are also larger than those nearer to Jardim, and everything denotes it to be a more fertile country. From the top of the descent we obtained a fine view of the undulating, but uninhabited country to the east and south. The Serra here is much higher than on the western side,

and the descent is far from being an easy one; at less than a quarter of a league from it, stands the Fazenda of Maçapé, which is the principal house in that place. On our arrival we found two large flags waving in the court before the house, and the Visitador was welcomed by the discharge of about a dozen guns; shortly after our arrival, numbers of people, with children of all ages, began to assemble, and immediately after dinner the Visitador commenced his duties of baptism &c. Having made enquiries for the place where the fossil fishes were to be found, I went there, accompanied by Senhor Machado; after walking about half a league, we reached the spot which much resembled that near Jardim, the stones occupying a limited space on the slope of the rising ground that runs along the foot of the Serra; this site having lately been cleared and planted with cane, we had little difficulty in procuring abundance of stones, though few good ones, for after nearly two hours work, I could obtain no more than three or four tolerable specimens, most of the remains being very much broken. On our return we found an immense crowd of people assembled, while more were arriving, chiefly for the purpose of hearing the three masses that are always performed immediately on the entrance of Christmas Day. At nine o'clock in the evening mass was said under the veranda, at one end of which a small altar was erected, brilliantly illuminated with wax candles, and surmounted by a figure of the Virgin, about a foot and a half high, elegantly dressed, with a gold chain round her neck, to which was attached a small toy watch; the more respectable portion of the audience seated themselves on the ground within the veranda, while

the remaining men, women, and children were squatted in a similar manner on the area of the court in front of the house; altogether not less than a thousand persons were here assembled. After the conclusion of the ceremony we partook of a supper of fresh fish, and at ten o'clock the Visitador retired to his hammock to enjoy a little sleep, prior to the commencement of his midnight labours; I followed his example, but slept so soundly that I did not awake till after the conclusion of the mass, notwithstanding that my hammock was slung in the same confined room as that of the prelate, and the upper half of the door, which opened into the veranda, was open. No observations were made upon my apparent neglect, but I have no doubt that I was set down as a perfect heathen. In the morning mass was again celebrated, and when breakfast was over, the Visitador resumed his labours. During the day the place had all the appearance of a fair, European goods, jewellery, provisions, rum, &c., were on all sides exposed for sale, and in the evening, dancing was carried on in the open air until a very late hour.

The following day I returned with my friends to Jardim, the Visitador going in another direction about two leagues distant. When about half way across the Serra, we alighted at a spot where Mangaba trees abound, in order to collect some of the fruit, which is not considered good to eat until after it has fallen to the ground; on this occasion, Senhor Gouvea let go his horse's bridle, when the animal, finding itself at liberty, set off at a round pace on the road toward Jardim; I therefore instantly mounted with the intention of intercepting it, and in the act of turning round, struck my head with consi-

derable violence against the branch of a large tree, which in an instant felled me to the ground. I could remember nothing that subsequently occurred till we were within half a league of Jardim, when I awoke as from a sound sleep, and found myself on horseback proceeding along at a pretty quick rate behind my companions; I felt much sickness and a considerable pain in the lower part of my forehead, but worse than all, I found my memory almost gone, for after many attempts I could not recollect in the smallest degree where I had been, or where I was going; I recognized my companions perfectly, but could not remember their names, and though often spoken to, felt no inclination to answer; in this state of darkness and confusion I rode on in silence, unconscious of where I was going, and under the impression that I was just roused from a long sleep. It was dusk when we reached the town, and though aware of having been there before, I could not remember its name, nor did it occur to me, that it was then my place of residence. On parting with my friends I should not have known where to go, had not Pedro been waiting for me at the end of the street, for all my recollection of places was completely obliterated. Immediately on reaching home, feeling myself very unwell, I laid down and soon fell fast asleep, and on awaking late on the following morning, found myself still labouring under a severe head-ache; a confused recollection of where I had been now came over me, but I could not yet remember the name of the place, and had only a faint reminiscence of having fallen from my horse. I learned, however, from Senhor Machado, who called to enquire after me, that upon falling to the ground I re-

mained there some time in a state of insensibility, but that after a while I arose, and, without speaking to any one, mounted my horse, riding behind my companions all the way to the town, and answering nobody when spoken to; many days elapsed before I felt myself perfectly recovered from this accident.

Understanding that a very large deposit of fossil fishes existed at a place called Mundo Novo, about three leagues to the west of Barra do Jardim, I determined on making an excursion there prior to my departure. To effect this object it was necessary to cross a branch of the Serra de Araripe, at a point where as on the road to Maçapé, the ridge tends north and south; it is here, however, only about two and a half leagues broad. On my way I found two or three trees quite new to me, one being of large size, the *Copaifera nitida*, Mart., then covered with a profusion of small white flowers; its trunk yields an abundance of oil, which is employed in the cure of ulcers, and for frictions in cases of rheumatism. After crossing the Serra, I found the country still more dried up than at Jardim, the sides of the mountain exhibiting only a few green trees; along the foot of the Serra some fine large trees were seen, but as they were then destitute of both leaves and flowers I could not ascertain to what tribe they belonged; they are called Braúna by the natives, and afford an excellent timber, which is both hard and durable, being employed in the construction of sugar-mills, particularly for rollers. I also now saw for the first time, the remarkable *Chorisia ventricosa*, Nees et Mart., called Barrigúda by the inhabitants, from the shape of its stem, which swells in the middle to five times

the diameter of its upper and lower portions. About half a league to the N.W. from the foot of the Serra, we reached the first habitation on the way, which belonged to the person, to whom I was recommended; he received me very kindly, and invited me into the house, which was little better than a mere hut; upon learning the object of my visit, he kindly offered to accompany me to the spot. After partaking of breakfast we started, and in about half an hour reached the place; as in all the instances I had before met with, it occupied an isolated spot of considerable extent on the gentle slope of a low ridge, which runs along the base of the Serra: here also, as in other places, almost every stone contains the remains of a fish in a more or less perfect condition; most of the smaller ones, that were only four or five inches long, were perfectly entire, but the larger ones, some of which measured fully six feet*, were always in fragments. After three hours labour, I collected many tolerably perfect specimens, but no species different from those already obtained in other places. On returning with my companion to his house, an excellent dinner was prepared, for which he refused any recompense; the kindness I received on this occasion was indeed greater than could be expected from a person in his poor circumstances; I was glad, however, to have an opportunity of returning his civilities in town on New Year's Day, and in presenting him with several useful articles: assuredly I shall

* Some of the specimens I obtained at this place were of that species which M. Agassiz has done me the honour to name, *Cladocyclus Gardneri*, and are about a foot in depth; one, which from its great size, I was obliged to leave behind, was still deeper.

never forget the kindness of Antonio Martins of Mundo Novo.

There are two small tribes of uncivilized Indians living within the district of Barra do Jardim, but their numbers are fast diminishing: the one consisting of eighty individuals called Huamaës, generally reside seven leagues to the south west of that town: the other, called Xocos, amounting to about seventy persons, have their usual place of abode thirteen leagues to the southward. Though generally inoffensive in their disposition, they had a short time previous to my visit, been detected in robbing cattle from the neighbouring farms; they have occasionally made their appearance in the Villa, and are said to be dirty in their habits, and that when in want of better food, they will devour the rattle-snake, and other serpents.

In various parts of Brazil, I met with many individuals belonging to that remarkable sect called Sebastianistas; they take this appellation from their belief in the return to earth of King Don Sebastian, who fell in the celebrated battle of Alcazarquebir, while leading on his army against the Moors. Those who profess this belief, are said to be more numerous in Brazil than in Portugal: on his return, they say, that Brazil will enjoy the most perfect state of happiness, and all that our own millenarians anticipate, will be fully realized.

During my stay in Pernambuco, there occurred in connexion with this belief, one of the most extraordinary scenes of fanaticism which modern times have given birth to, and were it not well authenticated, would be almost incredible. Although much the subject of conversation in Brazil at that time, I am not aware that any public

account of it has reached Europe. The following letter which is translated from the "Diario de Pernambuco" of Monday the 16th of June, 1838, was officially addressed to Senhor Francisco Rego Barros, then President of the Province:—

"Comarco de Flores, 25th May, 1838.

Most Illustrious and most Excellent Sir,

In this first letter that I have the honour to address to your Excellency on the state of this Comarco, which is at present tranquil, I have to lay before your Excellency the most extraordinary, terrible, and cruel circumstance ever heard of, and one which is almost past belief. It is now more than two years since a man, called João Antonio, an inhabitant of Sitio de Pedra Bonita, a place about twenty leagues from this town, surrounded by woods, and near which are two large rocks, called together the people, and told them, that within those rocks there was an enchanted kingdom which he was about to disenchant, and that immediately afterwards King Don Sebastian would make his appearance at the head of a great army, richly adorned, and that all who followed him would be happy. He went on beautifying this place till the month of November of last year, when at the recommendation of the Missionary Francisco José Correa de Albuquerque, he made a journey to the desert (Sertão) of Inhamon, whence he sent back one João Pereira, a man of the worst passions, who on his arrival, at Pedra Bonita, proclaimed himself King, and began to instil superstitious notions into the minds of the people, telling them that for the restoration of the enchanted kingdom it would be requisite to immolate a number of men, women and children; that in a few days they would all rise again, and remain immortal; that riches would abound among all classes, and that all those who were either black or of a dark colour, would become as white as the moon herself. In this manner he brought over many of the ignorant people to believe in his false assertions and evil doctrine, so much so, that some fathers delivered over their children to the knife of the sanguinary tiger.

"On the fourth of the present month, he began his sacrifices, and, in the course of two or three days, not less than forty-two human beings gave up their lives under his hands, twenty-one being adults, and

twenty-one children; he also married every man to two or three women, with superstitious rites in accordance with his otherwise immoral conduct, this also being part of his idolatry; the result, however, was to him melancholy, for Pedro Antonio, brother to João Anton'o, the promulgator of these ideas, becoming impatient of this madness, or perhaps ambitious of becoming King himself, determined on assassinating him, which he carried into effect on Friday the seventeenth. It was on this day that the inhabitants, flying from place to place, gave notice of the proceedings to the Commandant Manoel Pereira da Silva, who immediately collected a small force of twenty-six national guards and countrymen, and setting out the following day, they met near the place, Pedro Antonio crowned with a wreath of flowering creepers, taken from his predecessor, and accompanied by a group of men and women, who cried aloud—'come on, we do not fear you, we shall be assisted by the troops of our kingdom.'

"They then advanced upon them with the bludgeons and swords they carried, killed five soldiers, and wounded five more; but being briskly attacked, twenty-six men, and three women, were instantly killed; and three men, nine women, and twelve children were made prisoners. The remainder, many of whom were wounded, fled to the woods. It was only on the evening of the eighteenth, that I just had notice of these disturbances, when I immediately got together forty men, and marched off at the head of them, but on my arrival, I found every thing had been quelled in the manner above related. The prisoners were conducted by my troops to this town, and the twelve children will be taken care of till the orders of your Excellency arrive respecting them.

God protect your Excellency.

Francisco Barbosa Nogueira Paz."

The district of Flores lies considerably to the south of the Villa do Crato, near the Rio de San Francisco, and in the province of Pernambuco. The occurrence was much spoken of during my stay in the neighbourhood of Crato, and I have conversed with the relatives of some of those who fell victims.

On the 31st of Dec., a very heavy thunder-storm oc-

curred at Barra do Jardim, followed by about two hour's rain, the first that had fallen that season, and the same again happened on the 2nd of January, indicating that the period of the rains was on the point of setting in; I observed, that in the confidence of this, the inhabitants had commenced their plantations of rice, and therefore lost no time in making my arrangements for returning to Crato in order to prepare for my journey into Piauhy. My departure from Jardim was fixed for the 3rd, for which purpose my horses were brought the night before from the pasturage and tied securely to some orange trees, with abundance of fresh grass, on which they could feed till morning, but at day-break two of the animals had disappeared; at first, I was apprehensive they had been stolen, but I despatched Pedro in search of them, and was glad to see him return, bringing the missing horses which had escaped to their old pasturage. Without any further delay I therefore started about noon, after taking leave of my friends, and reached Crato the following day.

CHAPTER VII.

CRATO TO PIAUHY.

Preparations for the journey—Leaves Crato—Passes Guaribas—Reaches Brejo grande—Discovers more fossil fishes—Passes Olho d'Agoa do Inferno—Arrives at Poço de Cavallo—Crauatá—Cachoeira—Marmeleira—Rosario—Os defuntos—Lagoa—Varzea da Vaca—Angicas—Crosses the boundary line of the province of Piauhy—Arrives at San Gonsalvo—Campos—Lagoa comprida—Difficulties of the road—Reaches Corumatá—Canabrava—Arrives at Boa Esperança, a large estate owned by an excellent clergyman—Is now in the midst of the great Cattle Districts—Nature of the Country described—Marked into two Kinds, Mimoso and Agreste—Passes Santa Anna das Mercês—San Antonio—Cachimbinho—Vegetation of the surrounding Country—Reaches Retiro—Buquerão—Canavieira—Crosses the River Canindé and arrives at Oeiras, the Capital of the Province of Piauhy.

After my return to Crato, all my collections were despatched for the coast by the 10th of January in order to be shipped for England, and I prepared everything in readiness for our journey, which I was assured might now, be undertaken with safety, as it had rained heavily nearly every day since the beginning of the month. I was, however, prevented from leaving so soon as I had anticipated, owing to the necessity of dismissing my ser-

vant Pedro. He had now been about a year in my service, and as he was intelligent and useful, and we had travelled together more like companions than master and man, and as he had moreover, acted with great kindness and attention to me during several slight illnesses, I always treated him with much indulgence, and certainly would not have parted with him, had he not returned that indulgence with ingratitude. For some time before this, he had conducted himself as if he imagined I could not do without him. It was on a Saturday that I intended to have left Crato, and on the morning of that day, I sent him to purchase several articles for our journey, but he did not return till two o'clock in the afternoon. Being still desirous of starting, I told him to fetch the other men who were to accompany us, and to bring the horses from the pasture; in reply, he said that he would go for them, but that I might start with them myself, as he did not intend to leave Crato till Monday; this being more than I could reasonably bear, I instantly discharged him. Fortunately at this very moment, I had a visit from a young Englishman, Mr. Edward Walker, who had come up to Crato while I was at Barra do Jardim, to take charge of a Rapadura Engenho in the absence of the owner, who, although a man upwards of forty years of age, was about to proceed to the College at Olinda, in order to study for the church. During two years before this, Mr. Walker had been travelling over the interior of the province of Ceara, and in the north of Piauhy, selling European goods, but about two months before he came to Crato, he had been robbed of all he possessed, and

had no other resource left, than to accept of the situation he then held, so that he might earn the means of enabling him to reach the coast. That occupation not being to his taste, he at once offered to accompany me as my assistant; I had therefore to purchase two additional horses for him and his trunks, and as there was some difficulty in procuring such as would answer our purpose, it was not until the fifteenth of the month that we could leave Crato. The day previous to my departure, was occupied in taking leave of my good friend Capt. João Gonsalvez, his wife, and daughter, and of my other friends.

It was four o'clock in the afternoon before we could start, and we passed the night at an Engenho, called Guaribas, at the foot of the Serra de Araripe, its distance being about a league and a half westward of Crato. On the following morning we resumed our journey soon after day-break, and shortly afterwards ascended the Serra during a heavy shower of rain, over a part considerably lower than that a few leagues to the eastward. The breadth of the Serra here is about thirty miles, the first half was very similar to other parts of it which I had previously visited, being quite level and open, the vegetation consisting of rather large and thinly scattered trees, and in many parts covered with an abundance of low shrubs. The most common tree here was a fine species of *Vochysia*, which I had only met with sparingly before, and which has a fine appearance, from its dark green, shining leaves, and the spikes of bright yellow flowers, which terminate the branchlets. The more westerly portion is very thickly wooded with small trees, large tracts of which are burned

down every year, to allow of a more abundant supply of herbage for the cattle and horses which are sent here to pasture, during the dry season. When about half way across, we halted under a tree to breakfast, having brought a large calabash full of water for the purpose of making tea, but we might have saved this trouble as we found an abundant supply in the hollowed stump of a tree; it was found to be of good quality notwithstanding that one or two frogs were swimming about in it. The western descent is very gradual, and ends in a long narrow ravine, which leads into Brejo Grande, a large valley surrounded on all sides, except to the westward, by branches of the Serra. Towards the western extremity of this valley, we arrived at the house of Col. Manoel do Barros de Cavalcante; I had been requested by his son who lives in Crato, to visit him, as he had been very ill for several days. He is the chief person in this district, which is not very thickly populated, where he officiates as justice of the peace (Juiz de Paz); on visiting him I soon found that he suffered from a severe attack of acute rheumatism, for which I bled him freely, and administered the usual remedies. In a marshy place near the head of the valley of Brejo Grande, we passed a large group of a beautiful palm, which I had met with in only a few instances below Crato, but which I afterwards saw in the greatest abundance in the swamps of Piauhy and Goyaz; it is called Buriti by the inhabitants, and is the *Mauritia vinifera* of Martius. This palm is not only the most beautiful, but one of the loftiest in the country; the leaves are fan-shaped, and form a large

round ball at the top of the stem, after the manner of the Carnahuba. It produces a great number of nuts about the size of a small egg, covered with rhomboidal scales arranged in a spiral manner; between these scales and the albuminous substance of the nut, there exists an oily pulp of a reddish colour, which the inhabitants of Crato boil with sugar and make into a sweet-meat; in Piauhy they prepare from this pulp an emulsion, which, when sweetened with sugar, forms a very palatable beverage, but if much used, it is said to tinge the skin of a yellowish colour. The juice of the stem also forms a very agreeable drink, but to obtain it, the tree must be cut down, when several holes about six inches square, three deep, and about six feet apart, are cut in the trunk with a small axe, which in a short time become filled with a reddish coloured liquid, having much the flavour of sweet wine. During my travels in Piauhy, we used occasionally to cut down these palms in order to obtain the juice.

During the night it rained very heavily, and in the morning it was still so wet that we could not resume our journey, indeed, Colonel Barros strongly recommended us to delay our departure till the following day, as the river to the west of his plantation would be much swollen by the rains; besides, the state of the road would not allow us to reach the place where we proposed to remain for the night. In the afternoon I visited another deposit of fossil fishes, about a mile distant from the house, being conducted by one of the colonel's sons, a very intelligent youth, and found it to be exactly similar to the others already described; the few specimens here obtained did

not differ from those found on the eastern side. During this walk I met with a large species of *Jatropha*, which is frequent in the dry woods, and is known by the name of Manacóba; it forms a small tree from ten to twenty feet in height, and the roots, which are far more woody than those of the Mandiocca, are in times of scarcity converted into farinha. The valley of Brejo Grande is chiefly planted with sugar cane, rice, and mandiocca, but only a very small part is yet under cultivation.

The weather having continued fine, I took my leave on the following morning of Colonel Barros, whom I found considerably better. After expressing himself deeply obliged to me for the relief I had given him, he wished to make me some compensation, but as I would not accept money, he insisted on my taking about half a bushel of rice, and a number of Rapaduras, as an addition to our stock of provisions. About a league from his house we passed through a small hamlet (povoacão) called Santa Anna, consisting of about half a dozen houses and a small church. The road was very good all the way, presenting, for the most part, a natural pavement in the shape of a horizontal bed of limestone in thin layers. After travelling about four leagues, we reached a place called Olho d'Agoa do Inferno, situated on a slightly elevated part of a narrow valley, and consisting of three or four houses. At this place we halted to take breakfast under the shade of a hugh Cassia tree, which was literally covered with large panicles of golden blossoms. Like the first league of this journey, the last was found to be very good, but the intermediate distance passes through a flat country, where, for nearly the whole way, the horses sank to their

knees in water and mud. We crossed the river mentioned by Colonel Barros several times, and it was manifest by marks left by the water on the banks, that it had been greatly flooded the day before; it was now not more than two feet deep. The lower portion of the country through which we passed is well wooded, the large trees consisting chiefly of *Mimosas*, and *Erythrina* covered with its numerous brilliant scarlet flowers, and the thick-stemmed Barriguda; some of the latter are of great size, the singularly swollen portion of their stems measuring about twenty-four feet in circumference, while the upper and lower parts were not more than eight. The additions made to my herbarium this day, were numerous; one of the most beautiful being a shrubby species of *Allamanda*, about six feet high, bearing abundance of large violet-coloured flowers, not unlike those of *Gloxinia speciosa*, and which I have called *Allamanda violacea*, from the colour of its flowers, those of all other species being yellow; an infusion of the root of this shrub is a powerful purgative, and is chiefly used in malignant fevers. About Olho d'Agoa do Inferno grows in great plenty a new species of *Coutarea*, which bears large white flowers, and called by the inhabitants Quina Quina branca, from its bark having been found to be an excellent remedy in cases of intermittent fevers, which greatly prevail in the marshy plains of the province of Piauhy. Almost every traveller who goes into that province carries away a quantity of this bark, and I remarked that nearly all the trees by the road-side had large portions of their stems stripped in consequence.

We left Olho d'Agoa in the afternoon, and shortly after-

wards entered a country very similar to that between Icó and Crato, but as the rain had been falling for nearly a month, everything was quite green. The rapidity with which vegetation advances in these deserts, after the first few showers, is quite astonishing; the annual grasses spring up through the white sand, the trees burst into leaf and bloom, and the perennial herbaceous plants, which during the drought were apparently destroyed, throw up their flowering stems in an incredibly short period. In crossing a small stream on this journey I observed the rock, forming its bed, to consist of gneiss, cropping out towards the west; beyond this place sandstone again made its appearance, but scattered over it are an immense number of large angular blocks of gneiss. After travelling three leagues, we reached a place called Poço do Cavallo, and put up for the night in an unfinished house, which, though roofed over, was open at the sides. Besides ourselves two other travelling parties had also taken up their quarters here. In a marsh near us a whole legion of frogs were holding their nightly concert, and so loud was their noise, that I found some difficulty in going to sleep. Shortly before reaching this place, I collected specimens of a fine large tree which I afterwards found to be very common in the district; it belongs to the natural order *Meliaceæ*, and is called by the Brazilians Cedro, from the wood resembling both in colour and smell that of the true Cedar; the wood is very much used for making doors, tables, and various articles of furniture. The leaves and flowers possessed so strongly the odour of garlick, that the atmosphere was rendered disagreeable to breathe. The pastures for our horses

were now excellent, the new grass being from four to six inches high, and very abundant. To the botanist it was quite delightful to travel through such a country, for nearly at every footstep something new and beautiful was added to my collections; the only drawback was the difficulty of preserving the specimens, owing to the great humidity of the atmosphere, and the want of proper means of drying the paper, as the sun now seldom shone out brightly.

The following morning set in with rain, but we resumed our journey about seven o'clock, when it cleared up; we had not, however, gone far when the rain began again to fall heavily, which, notwithstanding the protection from my umbrella, soon drenched me to the skin; we were obliged to travel two leagues before reaching any house, so thinly is this country inhabited. The place we arrived at was called Crauatá, consisting of only three very small houses, and as the rain continued without intermission, we determined to stay, if possible, in one of them during the remainder of the day; but we found only one room could be spared, which was so very small, that it would not contain more than my luggage, much less our party, which now consisted of four persons; our only remedy, therefore, was to go on in the midst of the rain to a place called Cachoeira, about a league distant. On our arrival here we found it consisting of four houses, all, with the exception of one where we obtained leave to put up, similar to those at Crauatá. This belonged to a person who had resided four or five years in Philadelphia, about eighteen years previously, and who still spoke a little English; on finding we were Englishmen, he gave us a hearty

welcome, and all the accommodation his house afforded, doing all in his power to render us as comfortable as possible; shortly after our arrival the rain fell in torrents, so much so, that a small rivulet which we crossed immediately before reaching the house, soon became impassable for horses, and had we been detained one hour later, we should have been obliged to remain on the opposite side without shelter. The rain ceased at four o'clock in the afternoon, but the very loud thunder which accompanied it continued nearly the whole day. The road from Poço do Cavallo to Cachoeira passed through an almost level country; many parts of which are well wooded with large trees, the most common being a species of *Cæsalpinia*, some large *Mimosas*, the Cedro, the Barriguda, and another kind which is very common, though not so large, called by the inhabitants Imbúzeiro; it is the *Spondius tuberosa*, Arrud., producing abundantly a fruit about twice the size of a large gooseberry, of an oblong shape, and of a yellowish colour when ripe; beneath its coriaceous skin there is a juicy pulp, of a pleasant sweetish acid taste. Like the Mangaba this fruit is only fit to eat when it is so ripe as to fall to the ground, when a large quantity may be eaten without inconvenience; during our journey to the Campo country of Piauhy, where it ceases to grow, we were seldom without a daily supply of it; a dish much esteemed in the Sertão, called Imbuzada is prepared with milk, curds, sugar, and the pulpy part of this fruit; the tree throws out long horizontal roots, which do not penetrate very deeply into the earth, and upon these are found, at short distances, round black-coloured tubers about eight inches in diameter, consisting entirely of a

white cellular substance which is full of water; these, which are evidently intended by nature to supply the vegetation of the tree during the dry season, are often dug out by travellers for the sake of the water they contain, each tuber yielding about a pint of excellent quality. Another wild fruit common here, as it is also about Crato and Pernambuco, is produced by a tree growing to the height of from thirty to forty feet, called Pitombeira; it is the *Sapindus esculentus*, St. Hil.; the fruit is produced in large bunches, resembling in size the common grape; the outer covering is hard, but the embryo, or kernel, is covered with a thin transparent, sweetish, acid pulp, which alone is eaten; the kernels are said to poison turkeys if eaten by them.

Next day, the twentieth of January, we left Cachoeira, early in the morning, and after travelling about five leagues we arrived at a Fazenda called Marmeleira, where we rested during the middle of the day. Shortly after leaving Cachoeira we began to ascend a small Serra, by a very gradual inclination, but owing to its rocky nature the road was very bad in many places. This range consists of gneiss, the stratification of which is nearly vertical; large blocks of the same kind of rock were very commonly seen along the road, but on the ascent of a small hill I observed many rounded blocks of a coarse whitish sandstone. On the journey we crossed several rivers, which although very small, or wholly dried up in the arid season, were now so much swollen by the recent rains, that we could with difficulty pass some of them. After crossing the Serra we entered a fine valley about a league in length, well wooded with large trees, and having a small river

running through the centre of it; the end to the westward was pretty well cleared of trees, and there is a little hamlet called Rosario, beyond which we had nearly half a league to travel before reaching our resting-place. On this journey were found several new species of the beautiful genus *Angelonia*, one of the most remarkable being a fine climbing shrubby species (*A. bracteata*, Benth.); on dry rocky places I observed several kinds of *Cactus*, which are not so common on the western side as they are on the east of the Serra de Ibiapaba. The genus *Loasa*, so very common in Chili and Peru, has only few representatives in Brazil; one which, I have called *Loasa rupestris*, was found here in rocky places by the side of a stream just before we reached our resting-place; like other species of this genus, the whole plant stings very powerfully, and hence, in common with other stinging plants, it is called by the inhabitants Cançançao. As the sun shone out brightly during our stay at Marmeleira, we were enabled to dry all our clothes and other things that had been soaked by the rains. Here I prescribed for the mistress of the house, who was in a very delicate state of health; in return for this we were abundantly supplied with milk, which, at this season is plentiful. In the afternoon we travelled three leagues further, and towards dusk arrived at a place consisting of a few small houses called Os Defuntos, near which is a marsh abounding with frogs; the loud and disagreeable sounds they produced could only be compared to the half-howling, half-barking noise of a large kennel of hungry dogs. On some trees near the marsh several large owls were seen, attracted no doubt by the frogs, which they are said to destroy in great numbers for food.

On the following morning after travelling about five leagues through a level and rather open country, we arrived at a place called Varzea da vaca; when about a league beyond Os Defuntos, we passed a Fazenda called Lagoa, belonging to Senhor José Pereira de Hollanda, the person, who without leave took the loan of my horse during my stay in Crato. His place derives its name from a lake in the vicinity of the house, which is much frequented by wild duck and other water-fowl. Before reaching Varzea da vaca, we passed several other Fazendas, where large herds of cattle were seen grazing in the open Campos. Varzea da vaca is a hamlet consisting of about eight houses, but within the district that bears that name, they reckon about sixty; the residents are almost all cattle farmers, some of the poorer families only possessing half a dozen head, while others own upwards of a hundred; they also have small plantations of Indian corn, rice, mandiocca, and french beans. The inhabitants of the house in which I was to put up, appeared to be very poor; the building was small and very ill-constructed, having only a large opening in one side, that served for entrance, without any door to keep out either wind or rain; it consisted of only two apartments, the inner one being occupied by the family, the other by my party and that of another traveller who also remained here for the night, which proved to be stormy; in order to shelter ourselves from the wind which blew in at the door, I was obliged to hang before it one of the large skins used to cover the loads on the horses. In the afternoon I shot several birds, and also met with some curious annual plants which had sprung up in the sandy Campos.

Leaving Varzea da vaca about seven o'clock on the following morning, and travelling about two leagues, we halted at a Fazenda, called Angicas; I intended to have proceeded further without stopping, but as it was raining very heavily I remained here till the afternoon, when the weather having cleared up, we went on two leagues further to San Gonsalvo, which we reached about sunset. The country betweeen Varzea da vaca and Angicas is flat and sandy, being one of those tracts called Taboleiras; in some places it is covered with a low shrubby vegetation, while in others are seen numerous large kinds of *Cactus*. Among the many beautiful plants met with on this journey, was one particularly worthy of notice: it is a species of *Echites*,* growing abundantly on the open sandy places; it is not more than six inches high, with subulate leaves and pink-coloured blossoms not unlike those of *Phlox subulata*; it is called by the inhabitants of the Sertão, Cauhy, and the tuberous root, which is the size and colour of a large black turnip-radish, is eaten by them when cooked, and is said to be very palatable; in the raw state it tastes not unlike a turnip. This root is also a favourite food of the Peccary (*Dycoteles torquatus*, Cuv.), which is very expert at digging them up with its snout, the sand being in many places full of the holes they had made for this purpose. About half a league beyond Angicas, a small lake is seen, which forms the boundary between the provinces of Ceará and Piauhy. There are two houses at Sãn Gonsalvo both belonging to cattle farmers, father and son; at the end of the last rains they possessed conjointly

* *Echites tenuifolia*, Mikan. *Dipladenia tenuifolia*, var. *puberula*, Alph. D.C., Prodr. 8. p. 482.

about three hundred head of cattle, but the severe drought that occurred previous to the setting in of the present rainy season, had left them only about forty, all the remainder having perished from the want of water and grass.

Next morning after travelling three leagues and a half through a rather level, and tolerably well-wooded country, we arrived towards mid-day at a place consisting of three houses called Campos; the tree most abundant on the road was the Imbuzeira, the fruit of which, called Imbú, was observed in such great plenty that the ground beneath them was completely yellow; we ate abundantly of it, and found it very grateful. About a league from Campos the country abounds with an arboreous species of *Jatropha*, with small white flowers, and sinuate leaves not unlike those of the holly, only larger; the footstalks of the leaves are furnished with a few long pointed prickles, and without being aware of their nature, I laid hold of a branch to collect a few specimens, but had no sooner done so than my whole hand felt as if it had been dipped into boiling oil, caused by the venom of the prickles which in many places had punctured the skin, and it was intolerably painful for several hours; on my next attempt I was more cautious, and succeeded in obtaining a few specimens. This plant is called by the inhabitants Favella, and in the dry season they scrape down the bark and wood, which they put into the pools where the large pigeons and other birds resort; after having drank of this poisoned water they either die or become very much stupified, and in this state are taken and eaten by the people. On this journey we saw a great many Maccaws

(*Aráras*), but they would not allow me to come within shot of them.

In the afternoon we made another journey of about a league and a half, through a flat sandy country, which yielded me several novelties, and remained for the night at a large cattle Fazenda, called Lagoa Comprida. This house was one of the largest we had seen since leaving Brejo Grande; it is situated on the margin of a lake about four hundred yards long, from which it takes its name; no rivulet empties itself into the lake, which becomes filled during the rainy season, and if the rains have been heavy, it does not dry up before the next wet season. By the proprietor I was informed, that on the previous year very little rain fell, and that in consequence of this, and of the very great drought afterwards, the lake dried up before the setting in of the present rains, the result of which was, the death of nearly all the cattle belonging to the Fazenda. The people were still in an almost starving state, and although both at Campos and here I endeavoured to purchase some provisions for our own use, nothing was to be had, neither fowls, sheep, goats, pigs, nor beef; money I found to be of no use. Our next stage was one of three leagues, and brought us to another Fazenda, called Corumatá. The country was undulating but not hilly, and in many places it was covered with immense blocks of granite; so large and square are some of these blocks, that at a distance we mistook a cluster of them for a large village. Two circumstances occurred to detain us a long time on the road. Having dismounted to collect some specimens, my horse ran off into the woods, and it was nearly an hour before he could

be taken; and a little further on, in passing over a sandy piece of ground abounding in ant-hills, the road gave way while a loaded horse was passing over one of their large excavations, and as he was more than half buried in the sand, it was a long time before we could extricate him. Shortly afterwards, we descended by an exceedingly bad road, consisting of large blocks of granite, into a valley through which a small river runs, immediately after crossing which, we arrived at Corumatá. The owner of this farm does not reside on it, the charge of it being given to a cowherd (Vaqueiro). Here again we could obtain nothing to purchase, but the Vaqueiro presented me with a small piece of dried beef, and abundance of excellent milk; the Fazenda, he told me, produces yearly about two hundred calves; the cattle go at large in the woods and fields, but at this season, which is the one in which the calves are produced, the Vaqueiro and his assistants, who are generally slaves, are constantly on the look out for such as may have calved. The calves are then brought to the house, and put into a large enclosure called a Curral, and as a matter of course the mother follows. In this enclosure the cows and the calves are shut up together at night, but during the day, the cows are turned out to feed; this is a very necessary precaution in such a wild country, to prevent the mothers from straying into the woods; a little milk is taken from each cow in the morning before being turned out, at night they are not milked at all; of part of the milk they make a soft kind of cheese, which is much relished by all classes of society. They had not commenced making it here generally, but in the evening, one of the under herds came to offer

a large one for sale, which I was glad to purchase for the sake of my men. Shortly after we arrived at this place, a tremendous thunder-storm passed over us from the westward, followed by torrents of rain, and in a short time the small river became so much swollen as to be impassable; as the road to Canabrava, our next stage, passes over this stream, we were obliged to remain here till the following afternoon, when, on attempting to cross it, we found it still so deep, that all the loads had to be taken off the horses, and carried over on the heads of the men. Here a curious natural object presents itself: on a bare conical-shaped hill about 800 feet high, being the termination of a ridge, called Serra Grande, there is a stone of immense size placed on the top of another much smaller, and the point on which it rests, appears to be so small, that one is led to think that a very slight breeze would upset it. Keeping along the margin of the river, we arrived towards sunset at a place where the road crosses it twice, occasioned by a sudden bend, but we were informed at Corumatá, that there was a bye-path in the woods, which would render this unnecessary. It was now night, and although the moon shone very brightly, we had some difficulty in finding this path, when we did, it was so much overgrown with bushes, from being little frequented, that we had much labour in driving the horses along it with the loads. After toiling about an hour in this labyrinth, much to our joy, we reached the road leading from the river to the Fazenda of Canabrava, where we arrived in about a quarter of an hour. This is a very large Fazenda, and when we asked for accommodation to pass the night, we were shown to an old

shed, the roof of which, in many places, was much decayed; as soon, however, as the proprietor learned from my men who I was, he invited me into the house, and prepared an excellent supper, of which we partook with much relish.

As we left Canabrava early next morning, we expected to reach our next stage, Boa Esperança, about eleven o'clock in the forenoon, but in this anticipation we were sadly disappointed. The river runs in a zigzag direction along a valley which stretches between these two places, and as the road passes through the centre, we had to cross the stream no less than eight times in this short distance, although a road might be made with very little labour, to avoid the river altogether. It is seldom, however, that travellers are annoyed so much as we were, for during the arid season, the bed of the river is altogether dry. In four of the passages it was necessary to take all the loads off the horses, and carry them across on the heads of the men, but in the others, we managed to avoid this trouble, with the exception of the bundles of paper containing specimens, which I always caused to be carried over by one of the men. As we were all obliged to assist in this work, we were exposed during the greater part of the day to the burning rays of the sun, nearly in a state of nudity. My legs were very much burned, as were those of Mr. Walker, so much so, that on the following day they were completely blistered, and so greatly swollen that I was laid up for nearly two days. This taught me a lesson to be more cautious in future; but on this occasion, I thought that as the blacks did not hesitate to expose themselves to the sun, I might do so

and pliant leaves than those of the Campos Agrestes, of which I shall hereafter speak. The cattle reared in the Mimoso country very soon get fat after the rains have set in, and their flesh is much more esteemed than that of those which have been fed on the coarse pastures of the Agreste districts.

Padre Marcos de Araujo Costa is well known throughout the north of Brazil, not only for his intelligence and learning, but for his excellent moral character, and benevolent disposition; and during the eight days I lived in his house I had ample opportunities of verifying the truth of these accounts; if all the priests in the country were only half as active, well-informed, and as anxious for the diffusion of education as he is, the condition of Brazil would soon become very different from what it now is, and what I fear it will long continue to be, in the present state of things; the activity of this old man, for he was then upwards of sixty years of age, was quite surprising, and his philanthropy was not less so. As the means of education in this large and thinly populated country comes only within the reach of a very few, he has regularly for many years past been in the habit of boarding and educating in his house, free of expense, twenty boys, till they have acquired a tolerable knowledge of the Latin language, and the elements of philosophy and mathematics; he is himself an excellent scholar, and possesses a pretty extensive library of classical and philosophical books; of botany and natural history he knew enough to render these subjects an amusement to him; in his library I found nearly all the works of Linnæus, those of Brotero, and the rare one of Vandelli on the plants of Portugal and Brazil,

which latter he kindly presented to me; he holds no living in the church, contenting himself with the quiet and retired life of a cattle farmer, and devoting his leisure hours to the education of his pupils. During my stay at Boa Esperança I made several short excursions in the neighbourhood, accompanied by the old Padre and Dr. Marcos de Macedo, and added many novelties to my collections.

Two days before we left, Senhor Francisco de Souza Martins, one of the deputies from the province of Piauhy, and nephew to the President of the province, arrived on his way to Rio de Janeiro, accompanied by his brother Major Clementino Martins. They came by way of San Bento, which is the first stage from this place on the road to Oeiras, the capital of the province. This was our proposed route, but they gave us so bad an account of the roads, in consequence of the swelling of the rivulets, that I determined by their advice, to take a different road, which though more circuitous was said to be much better. The Major and one of the blacks who accompanied him, were laid up with ague from continued exposure to the rains.

On the third of March we made preparations for leaving the residence of the good old Padre. During our stay we fared most sumptously, as every day in the year a fat ox is killed for his use and that of his establishment; a day or two before our departure one was killed, and the flesh dried for our use on the journey, so that with other presents I received from him, our provision boxes were so well filled that we required little in addition till we reached the city of Oeiras.

After an early breakfast I parted with my kind host, who on account of his other visitors did not accompany me far, but Dr. Marcos rode with me for upwards of a league and a half, when we parted with mutual regret, it being so seldom that one who has a taste for the study of nature, meets with a kindred spirit in those distant regions; since my return to England we have kept up a correspondence, and he has sent me specimens of objects in natural history, many of which are different from those which my limited stay enabled me to obtain. At the very onset of our journey, we met with an accident that did not give us a very favourable idea of the state of the road. At about two leagues from Boa Esperança, three of the cargo horses plunged up to the middle in a swamp; the surface was covered with grass, and appeared perfectly solid, but the soil beneath had become so much saturated with water, that it was quite a mass of tenacious mud. It was with no small difficulty that the animals were extricated; in leading them across they often sank again; all the loads had to be carried over, and as we had to lend a hand at this work, we shared the same fate as the horses, being frequently up to the middle in the mud. These spots are called Atoleiras by the Brazilians, and are very much dreaded, as horses are occasionally lost in them; during the day we had to pass three more quagmires, but none so bad as the first.

Our first stage from Boa Esperança was the Villa de Santa Anna das Mercês, and when about two leagues from it, we halted under the shade of an Imbuzeira to dine and to give the horses a rest. The dry rocky places in this neighbourhood were covered with a little gregarious *Melo-*

cactus, bearing very long recurved spines, and in a moist sandy place I found many pretty annual plants. About sunset we came in sight of the Villa, which is situated on a slight eminence; on entering it, we put up for the night in a large unfinished house belonging to Padre Marcos of Boa Esperança, but we were glad to retreat from it as quickly as possible, for it was so full of fleas that we were completely covered with them, nor was it till a large fire had been kindled in the middle of the floor, that the place became at all bearable. As both Mr. Walker and I had on very long boots, we suffered much less than the blacks whose legs, from the knees downwards, were bare: I observed that when they were kindling the fire they would hold first one leg and then the other over the flame, and with their two hands stroke them downwards to get rid of these annoying creatures. In other places in Brazil I have met with these insects in abundance in houses which have been shut up for some time, but never did I see them so numerous as they were here; to escape their attacks during the night, we were obliged to sling our hammocks very high, and to undress on the top of a table.

The Villa de Santa Anna das Mercês, or as it is more commonly called Jaicóz, is situated about five leagues to the west of Boa Esperança, and contains about seventy or eighty houses built in the form of a large square, but only three sides of it were then completed; in the centre of this square there is a very handsome small church. The outskirts of the town contain many huts belonging to the poorer classes, chiefly constructed of the stems and leaves of the Carnahuba palm, which grows abundantly in the neighbourhood; a few shopkeepers, and

tradesmen, such as tailors, shoe-makers, &c., reside constantly in the town, but the greater number of the houses belong to the neighbouring Fazendeiros, who only occupy them during the Christmas and other festivals. Shortly after leaving the Villa, on the following morning, we ascended a low Serra which runs past the northern end of it; like almost all the other Serras which exist in the north of Brazil it is quite level on the top; it consists entirely of a coarse white sandstone very full of rounded quartz pebbles; the latter are also very abundant to a great distance round the Villa, and in many places the roads have the appearance of having been gravelled with them. The breadth of this Serra at the place where we crossed it, is about a league and a half; and it is principally covered with low *Mimosas* and *Croton*, which in many places grow so thickly together as to be almost impenetrable. The few open tracts which exist on it afford good pasture during the rains. After descending from this Taboleira, we entered a flat well-wooded country, and having twice crossed a small river which was considerably swollen, we arrived at the Fazenda of St. Antonio early in the forenoon; the distance we travelled was only three leagues, but as the next stage was said to be long, and as the accounts we received of the state of the roads were bad, we remained at this place till the following morning. The Fazenda of St. Antonio is small, its stock of cattle yielding only about one hundred and fifty calves per annum; many of them, as well as of the full grown cattle, the owner informed me, fell victims to the Ounces which are not uncommon in the neighbourhood. About three months previously he killed a large black one, and

the skin and head which he had preserved, showed it to have been an animal of great size and power. This head, as well as those of several others, which from time to time he had destroyed, were stuck up on the tops of tall posts near the entrance to his Curral.

At daybreak on the following morning we left St. Antonio, and after a journey of six long leagues reached a little hamlet called Cachimbinho; the country between the two places is nearly level, and the road one of the worst on which we had yet travelled. The river we forded on the previous day runs to the westward in a zigzag direction, and the road crosses it no less than twenty-seven times, on which occasions, owing to the depth of the water, the loads had to be taken off the horses, and carried over on the heads of the men; we had also to cross several small lakes through which the road passes, and having the mortification to lose our way, it cost us much additional trouble to regain the right track.

Shortly after leaving San Antonio we passed through a forest of Carnahuba palms, in which were several large lakes, which contain water only in the dry season. On the margin of one of these we saw a number of water-fowl, called by the inhabitants Jabirú (*Mycteria Americana*, Lin.); these birds, which are nearly related to the Adjutants of India, are of immense size; they are of a white colour, with the exception of the head, neck, beak, and feet, which are black; the black skin investing the head and neck is destitute of feathers. We afterwards met with them in much greater abundance by the margins of streams and lakes, where they feed upon small reptiles, fishes, &c. The vegetation of the other parts of the country through

which we passed was principally virgin forest, with an underwood of *Croton Bauhinia,* and trailing *Mimosa.* Near a Fazenda called Ambrosia, the road led under some large trees, on one of these I observed some hundreds of Marmoset monkeys, one of which I shot for a specimen; it fell before it was quite dead, and its pitiable screams brought back all its companions to the tree from which they had fled when I fired; here they remained for about ten minutes, when the cries of the wounded one having ceased, they left, and soon disappeared among the branches of the other trees of the forest; it was impossible not to admire the graceful activity they displayed in passing from tree to tree, and from bough to bough.

On the following day we travelled about five leagues, and shortly after mid-day arrived at a Fazenda called Retiro. The two first leagues led through a virgin forest, consisting almost entirely of a kind of *Mimosa* called Angica, (the bark of which is used all over the Sertão for tanning leather, and a gum which it exudes is said to form the principal food of the Marmoset monkey), a *Zizyphus* (Joazeira), and a few large species of *Bignonia,* with an underwood of *Croton Bauhinia, Lantana, Myrtles,* &c. The road continued quite level, and we frequently passed the same stream we crossed the day before, without the necessity of removing the loads. Leaving this forest tract we entered one more open, and abounding in Carnahubas; in many places the soil was very sandy, and scant of herbaceous vegetation. At about three leagues from Cachimbinho we passed through a small hamlet called Samambaia, consisting of about twenty scattered houses. The principal occupation of the inhabitants is the manufacture

of hammocks, which are sold chiefly to travellers who pass this way. They are made of cotton, which grows very well in the neighbourhood. From Samambaia the country still continues very flat till within a short distance of Retiro, when it becomes more undulating, exhibiting several ridges of lime-stone, nearly bare of vegetation, or of a fine red sandstone, which lies beneath the limestone, full of nodules of iron-stone, which from the wearing away of the rock are thickly strewn over the surface; they are of all sizes, from very minute particles, to rounded blocks as large as two fists; they are of a black, or very dark brown colour, assume a variety of shapes, and, judging from their weight, are rich in iron.

The Fazenda of Retiro stands on a rising ground on the banks of the Rio das Guaribas, which was one of the largest we had yet encountered, but from the recent dry weather, the water was so low, that on the following morning we crossed it without difficulty; its banks exhibited signs of having but a short time before been very much flooded. A journey of two leagues brought us to a Fazenda called Buquerão, where in consequence of rain we remained till the following morning, when continuing our route through a generally flat country, but full of isolated rocky hills, containing few trees, and a very scanty herbaceous vegetation, we arrived at the Fazenda of Canabrava, after travelling about four leagues. This estate belongs to Col. Martins, the father of the two gentlemen whom we met at Boa Esperança, and brother to the Barão de Parnahiba, the President of the Province of Piauhy. As I carried letters of introduction to him from Padre Marcos, I was received with the greatest

politeness and hospitality; here we remained for the night, and on the following morning were not allowed to leave till we had partaken of a breakfast of coffee, which the Colonel told us was an excellent preventive for ague, which is very common at this season, in the country we were now about to enter. The old man was in deep grief at the loss of one of his sons, who but a short time before, had died suddenly at his Fazenda about twenty-four leagues distant. As several roads led off in various directions a little beyond the house, he kindly sent a black boy to put us in the right path. A journey of about five and a half leagues, through a beautiful grassy country abounding in herds of fine cattle, brought us to a plantation called Canavieira, belonging to Major Clementino Martins, whom we met at Boa Esperança; we saw here a large field of sugar-cane, being the first we had met with since we left Brejo Grande. As the Major never resides at this place, the house is a very poor one, and in a very ruined condition; we were obliged to take up our quarters in a sort of shed, which formed a great contrast to the comfortable lodgings we had enjoyed the night before. A day or two afterwards, we found in consequence of sleeping in this hut, that a number of those little insects called Chigoes (*Pulex penetrans*, Lin.) had got into our feet: they are only found near dwellings, and are met with in all parts of the country I visited, from the sea-coast to the high mountains in the Diamond district. They burrow under the skin to produce their young, the insect itself dying, they are at first easily detected, by the not unpleasant tickling sensation they produce in entering the skin, and of course are easily

removed by a pin or the point of a pen-knife. When they have reached maturity, the abdomen becomes a bag about the size of a small pea, full of eggs, of a yellow colour, and the spot looks like a fester. Unless this bag and its contents are carefully removed, a bad sore may be produced; the feet of careless blacks not unfrequently get into so bad a state from neglecting to remove these insects, that amputation of the part becomes necessary.

On this journey I made numerous new and beautiful additions to my botanical collections; when passing over a low flat hill, the top of which was rather rocky and bare, I found large patches covered with a dwarf fruticose *Cuphea* with small leaves, bearing numerous purple flowers, and so much did this plant at first sight resemble the heather of my native hills, that I imagined I had found a species of that genus; although disappointed, this little incident recalled many pleasant recollections of home. It is a remarkable fact in the geographical distribution of plants, and not generally known to those who have not made that subject their study, that though heaths are very common in Europe and Africa, not a single species has hitherto been detected on the American continent, either South or North. This is the more remarkable, as the great mass of vegetation at the Cape of Good Hope is made up of these plants, nearly four hundred different kinds having already been found there. From Canavieira, a journey of six leagues brought us to the banks of the Rio Canindé, at a place called Passagem de Dona Antonia, and distant only a league and a half from the city of Oeiras. Our route was through an almost continued forest of Carnahuba palms, and as the

Rio das Guaribas ran nearly parallel with it, and had recently overflowed the flat country on each side to a great distance, we found the roads very bad from the great deposit of mud, which had been left often more than a foot deep. In many places the palm stems shewed by their muddy appearance, that the water had covered them to the depth of upwards of twelve feet. At this season, intermittent and malignant fevers are very prevalent, from the malaria arising from the vast tracts of country left dry by the fall of the rivers. It being too late when we arrived to cross the river and reach the city before dark, we remained with some other travellers at the ferry-house for the night.

Next morning, the 12th of March, all our luggage was taken over to the opposite side of the river, in a small canoe, which had to return several times, and afterwards the horses were swam over one by one. Passing through a flat sandy country covered with small trees and beautiful flowering shrubs, we reached the city of Oeiras about eleven o'clock in the forenoon.

CHAPTER VIII.

OEIRAS TO PARNAGUA.

The Author's reception by the President of Piauhy—City of Oeiras described—Its Population—Its Trade with the Coast—Great want of River Navigation—Its chief exports are hides and cattle—Its Climate—Diseases—Character of the Barão de Parnahiba—His great power in the Province—History of this Remarkable Man—And of the Civil War on declaration of the Independence of Brazil—Resources of the Province—National Cattle Farms—Course of the Author's Journey quite changed by an alarming Revolt—This Insurrection described—He determines on travelling southwards through Goyaz and Minas Geraes—Leaves Oeiras—Description of the Country—Chapadas—Passes through many Cattle Farms—Curious mode of catching Cattle—Passes Pombas—Algodões—Golfes—Retiro Alegre—Genipapo—Canavieira—Urusuhý—Prazères—Description of a Piauhy Family—Reaches Flores—Rapoza—Arrives at Parnaguà—Universal Hospitality of the Natives—Salt found in the Neighbourhood.

As I brought several letters of recommendation with me to the Barão de Parnahiba, the President of the Province, I made enquiries for his house on entering the city, and was directed to it by a soldier. The Palacio, as it is called, is situated on the most elevated part of the town, is of one story, and has a very ordinary appearance. On arriving at the door I found it guarded by a sentinel, one of the most abject looking beings that can

also; their skin, however, I found to my cost, was made of tougher material than mine. By the time we had crossed the river, for the eighth and last time, it was about five o'clock in the afternoon, and in ten minutes after, we arrived at the Fazenda of Boa Esperança, in an almost exhausted state, from the excessive fatigues of the day. We were cheered, however, by the kind reception we received from its excellent and learned proprietor, the Reverend Padre Marcos de Araujo Costa, and his adopted son Dr. Marcos de Macedo, who had only a short time before returned from a visit to France and England, whither he had been sent at the expense of the Government to study the manufacture of porcelain, and whose acquaintance I had made a few weeks before at Crato, his native place. On this journey I added but little to my botanical collections, but in a moist meadow by the side of the river, I killed a beautiful Boa Constrictor, about seven feet long. Although these reptiles are frequently met with in the dry country, called the Sertão they are neither so numerous nor so large as those found in the swampy plains of Piauhy and Goyaz.

The Fazenda of Boa Esperança is one of the largest I had yet visited in Brazil, giving pasture to upwards of 5,000 head of cattle, and several hundred sheep. Although like all others in the Sertão, it is occasionally exposed to long droughts, yet here there is an abundant supply of water all the year round, even should no rain fall for more than twelve months. The river passes at a little distance from the house, and although it only contains water in the wet season, an abundant supply is obtained at all times, by means of a high and very strong

dam thrown across it at a place where its banks are somewhat high, and rocky on each side. This dam notwithstanding that it has been built more than fifty years, is still as effective as when first constructed, a circumstance not a little astonishing in a country like Brazil, where works of this nature are in general so badly executed. The house is built on a slight eminence, and as there are about thirty smaller houses behind it belonging to the slaves, the place has all the appearance of a small village; near the house the Padre has erected a neat chapel, in which he says mass every morning to his people.

The country in which this Fazenda is situated, (as indeed, the whole of the eastern portion of Piauhy, and nearly the whole of the province of Ceará) is called by the inhabitants of the Sertão, Mimoso, in contradistinction to the central and western portions of Piauhy, to which the term Agreste is applied. The vegetation of the Campos Mimosos is characterized in the first place, by the forests being of that nature called Catinga; these are the forests which I have already spoken of as losing their leaves in the dry season; it is remarkable that they form buds like other deciduous trees, but should no rain fall they can remain for several years without producing foliage. In the second place, as has been very correctly remarked by Von Martius, the general vegetation of the Campos Mimosos is distinguished by the tenderness of fibre, rigidity of the leaves, the presence of hairs, stings or prickles, small flowers, and thick and frequent milky juice. The grasses of the pastures are for the most part annual, and generally of a brighter green colour, and have more tender

be imagined. He was a young mulato, dressed in the uniform of the troops of the line, which seemed as if it had not been off his back for the last six years; his cloth cap was old and greasy, his blue jacket one half patches and the other half holes, was open in front, displaying his naked breast, for he could not boast the possession of a shirt; his trowsers were a little better than his jacket, and his bare feet were thrust into a pair of old shoes, down at the heels, and open at the toes. Had it not been for his musket, and his upright position, I should certainly have taken him for a beggar. There was a pavement a few feet in breadth in front of the house, upon which, when I stopped, my horse's forefeet rested, and, before I had time to speak, the sentinel started forward, seized the bridle, and turned him off into the street. I then dismounted and was about to proceed to the door, but no sooner had I put foot upon the pavement, than I was served in the same way as my horse had been, and told that no one was allowed to enter the palace with spurs on. These I instantly took off, and having asked if anything else was necessary to be done, I was at last allowed to enter.

On reaching the lobby I was met by a sergeant, who asked me if I wished to speak with his Excellency, and who, on being told that I had letters for him, said that it was his duty to deliver them. After waiting about a quarter of an hour in the lobby, I was shown into a large room containing two small tables, a sofa, and a few chairs. Here I had not been more than five minutes, when his Excellency made his appearance with my letters in his hand. He told me to excuse him while

he read them, as also to pardon his undress, which he wore, he said, on account of the great heat of the day. The dress he had on was certainly one of a very light nature, but was that generally worn in the house by the inhabitants of this province; it consisted of a thin white cotton shirt hanging loose over a pair of drawers of the same material, which reached but a short way below his knees; his legs and feet were bare, the latter being thrust into a pair of old slippers; around his neck were several rosaries, with crucifixes and other appendages of gold attached to them.

While he was looking over my letters I could not help scrutinizing the appearance of an individual whose name is more celebrated than that of any other in the north of Brazil, and whose despotic government of the Province of which he is President, has gained for him the appellation of 'The Francia of Piauhy'. He was low in stature and strongly built, though not corpulent, and his looks bespoke considerably more activity, both of body and mind, than is generally met with in persons of his age in Brazil, for he was then about seventy years old; his head was remarkably large, and, according to the principles of phrenology, was pretty well balanced before and behind, but deficient in the region of the moral sentiments, and was of considerable breadth between the ears. In conversation his countenance had a sinister unpleasant expression, notwithstanding that it was generally covered with a half-formed smile. After finishing the letters, all of which he read over very carefully, we entered into a conversation respecting my visit to the province, but I could not make him understand that my collections were

for any other purpose than that of being converted into medicine or dye stuffs. That the productions of nature were studied for any other purpose than as regards their mere utility to man, he could not form the slightest idea. As soon as he learned that it was my intention to remain for some time in the city, he sent a person to procure an empty house for my use; and, as it was not furnished, he was kind enough to send me two chairs, a table, and a large earthern pot to hold water.

The city of Oeiras, the capital of the Province of Piauhy, is situated in a large circular valley, about a league in breadth, nearly surrounded by a broken range of low hills composed of a soft whitish-coloured sandstone. Until the year 1724, when it was raised to the dignity of a city, it was known by the name of Villa da Mocha, from a little stream which passes close to it and all the year round yields an abundant supply of water, which, however, in the dry season is very much impregnated with saltpetre. It is very irregularly built, consisting principally of a large square, and a few streets which proceed from the south and west sides of it. The population does not exceed three thousand souls; the most respectable part of which, not including those in the employ of the government, are shopkeepers who retail European goods. The greater part of the merchandize comes from Maranham, being carried in large canoes up the Rio Itapicuru to Cachias, from whence they are brought to Oeiras on the backs of horses. A portion is also brought by the same means from Bahia, but the distance is much too great to render such expeditions profitable; this is brought by drovers who go there yearly with cattle for sale.

Sometimes a solitary launch of twenty tons burden, laden with salt, arrives in the Rio Canindé, opposite Oeiras from the Villa da Parnahiba, a flourishing town near the coast on the east bank of a large river of the same name, which divides the Provinces of Maranham and Piauhy, and up which the navigation takes place. One such arrived during my visit, but it took nearly three months to perform the distance, which is about one hundred leagues. It is only during the rainy season, when the river is flooded, that this voyage can be undertaken, and the current is then so strong that the vessel has to be pushed up by poles all the way. Owing to the length of time, and the number of men required, it is seldom that such a speculation terminates profitably. It has been recently proposed by Mr. Sturz, the Consul General for Brazil, in Prussia, to navigate this stream by a small steamboat, but there are many reasons for concluding that this will never be successfully put into execution. It is not probable that the middle and southern portions of the Province will ever be much more populous than they are at present, as from the great yearly droughts to which they are liable, the cultivation of cotton or sugar can never be carried on. The only articles of export are cattle and hides, and the latter is all that a steamer would get as cargo downwards. As regards the import of European goods, it is not likely that the traffic would soon be changed from Marnham to Parnahiba. The river, moreover, would only be navigable during the rainy season, at which period the force of the current, and the numerous shifting sandbanks which its bed is said to contain, would render the transit both slow and difficult.

The city contains three churches, two of which though now of considerable age, are unfinished. There are also several other public buildings, such as a jail, military barracks, the provincial house of assembly, the Camara municipal, and hospital, but none of these are deserving of notice excepting the jail, which was then just completed; it was erected under the superintendence of a German engineer, who has resided in the province several years in the employ of the government; it consists of two stories, in which respect only two other buildings like it are to be found in the city; the lower part and wings serve as prisons and a house of correction, the upper story being used as a court of Justice. At the north end of the city there is a fine large building, now falling into ruins, which was the college of the Jesuits previous to their expulsion from Brazil.

The seasons are very regular in this district, and although very few old persons are seen, it is not considered unhealthy. A few showers generally take place in the month of October, but the regular rains do not set in till about the beginning of January, when they continue till the beginning of May; during this period thunder storms are very common, fearfully loud, and of long duration, and accidents it is said do not unfrequently occur from them. Between Crato and Oeiras we saw several large trees which had been shivered in pieces by lightning; and while in Oeiras I was informed that a Fazendeiro who was returning to his country house, after one of the church festivals, sent his family, consisting of his wife and several children, with their attendant slaves, a short distance before him; on overtaking them he was shocked to

find them all dead, having been struck by lightning from a thunder storm which was then passing over. The months of May, June, and July, are the most pleasant of the season, for then the rains have ceased, and everything continues fresh and green, and the atmosphere is comparatively cool, from a strong S.E. wind which prevails during this period. After the month of July a great change takes place, the whole country begins to wear a dry and arid appearance, the grass and other herbaceous vegetation wither up, and the trees and shrubs throw off their leaves. At this period too the cooling S.E. winds cease, and are followed by light variable ones or by calms, from which cause the air becomes so much heated, that no one stirs abroad, excepting those who are under the necessity of doing so.

The principal diseases in and around the city are agues and malignant fevers, particularly at the beginning and end of the rainy season; after the rains have ceased, and during the prevalence of the south east wind, pectoral complaints are not uncommon, and many cases of ophthalmia occur; in the latter, either because of improper treatment, or from neglect, many persons lose their sight. But the complaint for which I was most frequently called upon to prescribe, was dyspepsia, which, under its various forms, these people are most subject to; asthma and paralysis are also prevalent. At the time I visited Oeiras it could boast of two resident medical men and an apothecary's shop; the latter was but very poorly furnished with medicines, and those neither new nor of the best quality. The senior of the two medical men, Senhor José Luiz da Silva, an intelligent and amiable person, from whom I received

much kindness, holds the office of Cirurgião môr, and has charge of a small hospital, which is almost entirely devoted to the service of the military. He is a Portuguese by birth, and in his youth acted as a surgeon in the navy of that country. He had now resided thirty-six years in Oeiras, and was the father of a large and respectable family. The other, a young Brazilian, educated at Bahia, ill instructed, and of an unamiable disposition, was assasinated in the street a few months after I left. Although they both of them were accustomed to treat diseases generally, neither of them had the skill, and consequently, the courage to undertake any serious operation, notwithstanding that many cases had long called for professional assistance. An opportunity was thus afforded me of undertaking several operations, which few young surgeons in England have it in their power to attempt. The most serious of these were depression of Cataract, and Lithotomy; the former I performed three times, but with success only in one case, when such was the astonishment produced in the minds of these simple people, by the blind regaining his sight, that it was spoken of through the country as a result little short of a miracle. The operation for stone in the bladder was likewise performed by me three times, in all cases with the greatest success, and it is deserving of remark that these were the only instances of this complaint that I met with during my whole travels; there can be no doubt, therefore, that this complaint is of very rare occurrence in the country, but it is not easy to say from what cause this originates. My first patient was an otherwise healthy free black man, about thirty years of age, and it was astonishing to see

the rapidity with which the wound healed, but this has been found to occur universally in people of his colour. The second was a poor mulatto, who lived in a little palm hut in the outskirts of the city; both these poor fellows did all in their power to show their gratitude, and would willingly have parted with all they possessed to repay me, but of course I would take nothing from them. The third case was the most remarkable of all: the patient was a man about forty-five years of age, and one of the most respectable shopkeepers in the city. About nine years before my arrival, he had been treated by the surgeon in chief for stricture of the urethra, when by improper treatment a portion of a small leaden bougie passed into the bladder; this formed the nucleus for the stone, from which cause he suffered the most excruciating agonies that mortal could endure. I was consulted by him on my arrival, when I assured him that nothing but an operation would relieve him from his sufferings; being, however, of a very timid disposition, he would not consent to its performance, till after he heard of the success of the other two cases; assisted by my friend the Cirurgião môr, I happily succeeded in extricating the stone, which was about two inches in length. This occurred about a month before I left the place, by which time he was so far recovered as to be able to walk about his room. After a period of eighteen months I received a letter which he sent to meet me at Rio de Janeiro, in which he informed me that he had perfectly recovered, and offered me a thousand thanks (mil graças) for the good service rendered to him. Before I left, he gave me a very handsome gratuity of three hundred spanish dollars, two fine horses,

and many little necessaries suited for the journey I was then about to undertake.

The province of Piauhy sends two members to the national chamber of Deputies in Rio, but in all that relates to its internal government, the Barão de Parnahiba rules with despotic sway. He has been its President ever since the establishment of the independence of the Empire, with the exception of one short period, when another person was sent to supersede him, but he did not hold his appointment long, dying suddenly, and under suspicious circumstances. Since that period although the Presidents of all the other provinces are changed every two or three years, he has remained constantly in office. He is more feared than respected by the mass of the population and on an emergency can command among his own friends and dependants more than 2000 staunch supporters: he has always at his call those who are both ready and willing to execute his orders of whatever nature these may be. By the firmness of his government he has acquired many enemies, especially by the enactment of some provincial laws, respecting which it must be confessed in their favour, that their tendency is always to benefit the poorer classes of the inhabitants: among others, he has forbidden that beef and farinha, the two principal articles of food, be sold in the city above a certain fixed price, and that a very low one; however, he has always taken care that his own cattle be sent to Bahia and other distant more profitable markets, having abundant facilities for such arrangements. Although generally ill informed, he possesses a great share of shrewdness and cunning, qualifications highly requisite for the maintainance of the despo-

tism with which he has hitherto governed the province, under which it can certainly boast of a greater amount of peace and quietness, than almost any other province in the Empire. It is not a little strange that, notwithstanding his many enemies, only one attempt has hitherto been made to assassinate him, and that so late as the year before I arrived there.

On the 17th of January, 1838, on returning from one of his Fazendas, and when about half a league from the city, he was fired at from behind some bushes, the shot only wounded him in the right shoulder. The assassins, for there were two, fled immediately, and one of them appeared among the first to congratulate the Barão on his arrival after so fortunate an escape. Parties were instantly dispatched to scour the woods in pursuit of the delinquents, and a black man who was found hidden among some bushes, and who could not give a good account of himself, was taken to the city, and on being interrogated, confessed that although he was one of the parties, he did not fire the shot, the person who did so being one Joaquim Seleiro, a mulato saddler, who lived in the house of the Barão. This man was said to be of a very vicious disposition, and of strong passions; and it was well known that a few days before the occurrence, he had been ill used in some manner by the Barão, without just cause. At the time he was denounced, he was leading a party in the woods in search of the assassins; and was not a little astonished on his return to find himself a prisoner. He strongly denied the crime of which few deemed him to be innocent; the laws of the country do not inflict the penalty of death for a mere attempt at murder, he was

therefore committed to prison, where he died twenty-six days after the perpetration of that crime, under circumstances that have given rise to suspicious reports.

To those who are interested in the history of Brazil, a slight sketch of the life of so extraordinary a man as the Barão de Parnahiba, may not be uninteresting, as his name is intimately connected with the establishment of the independence of the northern provinces. His father was a native of the Azores, and was very poor when he arrived in Brazil, but he soon married a lady possesed of a small property; of the family resulting from this union, the subject of this notice was the eldest, being born in the year 1776. His only education consisted in learning to read and write, and in acquiring a slight knowledge of arithmetic. His first occupation was that of a cowherd (vaqueiro) to his father, who died when he was only twenty years of age, leaving him a Fazenda worth about 1,500 cruzados, (£200. sterling); during his childhood he was brought up by a godmother, who at her death left him another Fazenda of nearly equal value. After his father's death, not content with the occupation of vaqueiro, he began to purchase cattle with the view of taking them to Bahia for sale, to which place he continued to go every year, till about twenty-five years ago, although from that period up to the present, he has never failed to send annually a drove of cattle to the same market. Shortly after his father's death he was enlisted, as was then the custom, into the cavalry militia; here he was soon advanced to the post of corporal which he held for a long time; he was next elevated to the rank of ensign, and about the same time was appointed treasurer of the national rents. Occupied

in this manner, he continued till the period of the declaration of independence, when his name had acquired but little weight in the province, being better known for his cunning disposition and uncouth manners, than for any more eminent qualities. It was his custom to bestow gifts and attentions, and be very obsequious to all persons high in authority, such as governors, judges, &c., providing always men, horses, and provisions to bring them up from the coast. In this manner he ingratiated himself in their favour and after their arrival was always their obedient servant; and without regard to their line of politics was ever a staunch supporter of their measures: he made it his endeavour on all occasions to gain the good opinions of the religious part of the community, by showing himself to be a great friend to all that belonged to the church, on which account he was anxious to be appointed director of its festivals, on which he did not hesitate to spend large sums; in this manner he obtained the good will and friendship of the priesthood.

At the time when Dom João the sixth gave the Constitution to Portugal, the larger provinces of Brazil were ruled by Governors General (Governadores Geräes), and the smaller by Governors only, the power of all being to a certain extent despotic. At this time the province of Piauhy was committed to the charge of Elias José Ribeiro de Carvalho, a native of Portugal, but immediately on the proclamation of the constitution in the mother country, he was recalled when the province fell to the care of a provisional Government, consisting of six members one of whom was the present President. It was during this time that a Major Fedié arrived at Oeiras from Rio de Janeiro, as commander

in chief of the military force in the province; and who soon afterwards became notorious for his opposition to the cause of independence. It was also during the reign of this Governo Provisorio, as it was called, that Dom Pedro Primeiro proclaimed the independence of Brazil. It was of course a long time before the news of this great event, that had taken place in Rio, reached this far distant province, and when the accounts arrived Fedié, true to the fealty he owed Dom João, who had sent him thither, and supposing it to be only a disturbance of short duration, firmly opposed its proclamation in the city of Oeiras; and as soon as he learned it had been supported in the Villa da Parnahiba, he collected all the troops and militia he could raise, and marched against the inhabitants of that place, notwithstanding that he received previously official notice from the newly declared central Government in Rio, ordering him to proclaim the independence of the country in the city. At this time also, advices arrived from the provinces of Bahia and Ceará, both of which had followed the example of the capital, strongly urging the most influential persons in the province to adopt the same course in Piauhy, but all refused to do so, declaring themselves to be firm supporters of the constitution of Dom João.

At this time the influence of the Barão was so small that none of the letters were addressed to him, but the opportunity did not escape him, for by the same posts that carried the above answers, he sent notice to both places that he was willing, in conjunction with several of his friends, to give his warmest support and proclaim the cause of independence. Shortly after the departure of Fedié for Parnahiba, the Barão received answers to his letters,

and was urged to lose no time in carrying his proposal into effect, to which end he immediately apprehended the members of the provisional Government, who were in Oeiras, and confined them in prison, together with others who were either known or suspected to belong to the opposite party. The inhabitants of Parnahiba learning that Fedié was on the march for that place, united themselves and advanced on the road to meet him, the encounter took place at Campo Maior, about half way between Oeiras and Parnahiba, where in a very short time Fedié completely defeated the other party and put them to rout. In the meantime the Barão was using every exertion to raise men to march against Fedié, who was the most powerful opponent he had to dread. In order to give more weight to his authority, he first proclaimed himself President of the province; and under the pretence that Fedié was about to return to Oeiras, and that it was necessary to place them in security, he seized on the funds of the provincial treasury, which was said to be very rich at that time, but it is generally reported that the greater part of this treasure was never sufficiently accounted for; it is certain that at this time he laid the foundation of the great wealth which he at present possesses. He immediately sent advices to Rio de Janeiro stating what he had done, and in return Dom Pedro confirmed him in the Presidentship, advanced him to the rank of Colonel in the militia, and created his brother Commander-in-chief in lieu of Fedié. The latter not wishing to return to Oeiras, where every one was now in arms against him, marched immediately to the Villa de Cachias, the most flourishing town in the interior of the province

of Maranham; and which still remained loyal to the Portuguese cause. The imperial troops from Oeiras, having now united with those defeated at Campo Maior, together with about 2,500 more from the province of Ceará, headed by the President of Piauhy and his brother, marched to Cachias against Fedié, who with no more than 250 men maintained his position in that town for the long period of eleven months, and it was only when famine reduced them to the last necessity, that he capitulated, and was led back to Oeiras a prisoner. Thence he was conveyed to Rio, when he was liberated and sent to Portugal.

The march to Cachias was another fortunate circumstance, which it is said the President did not fail to turn to good account, for as nearly all the inhabitants of that place were natives of Portugal, and, consequently, favourable to the union of the two countries, they were naturally considered by the Brazilians as enemies, and, consequently, treated as such, in the worst possible manner, for they were murdered and robbed without mercy. To save their lives and property, many of them are said to have paid the President very handsomely for his protection, and in this manner he is believed to have amassed an immense sum of money. After his return from Cachias the Emperor raised him to the rank of a Brigadier, and created him Barão de Parnahiba. The entire management of the affairs of the province was left in his hands, as it still is, and, consequently, all situations were filled up either by his own relations, or by persons belonging to his party. On the occasion of the coronation of the present Emperor, he was created a Viscount.

One of the great sources from which the provincial

treasury, above alluded to, derives its income, is the profit resulting from the sale of cattle which are reared on thirty-three Fazendas belonging to the crown. About the end of the seventeenth century, one Domingo Alfonso established a number of cattle-farms in different parts of the province, and at his death thirty of these were put into the hands of the Jesuits, on the condition that the profits should be applied to charitable purposes; when the Jesuits were expelled from the country, these Fazendas, together with others they had purchased, became the property of the state. On an average about 3,000 head of cattle are sold annually; they are disposed of to the highest bidder, and although the price varies in different years, 6,000 reis (about fifteen shillings) may be taken as their mean value; were these properties well managed a much larger profit might be derived from them. Besides the salaries paid to three inspectors, amounting to 300,000 reis each, every Fazenda is managed by a vaqueiro, whose income is derived from the fourth part of the cattle and horses annually reared. These situations are much sought after, as in the course of a few years, the persons who hold them save large sums of money, having no house-rent to pay, and being allowed to have all the profits resulting from the other produce of the farm, such as sheep, goats, pigs, cheese, &c.; to assist in looking after the cattle, the government provides them with slaves whom they are obliged to supply with food and clothing, the former being all produced on the farm, and the latter, which is both scanty and coarse, costing but a mere trifle.

Shortly after my arrival in Oeiras, some very serious disturbances took place in the neighbouring province of

Maranham, which prevented me from following out my original plan of proceeding westward to the Rio Tocantins; I shall briefly notice the origin and progress of these disorders. In November, 1838, the Prefect of Cachias sent four soldiers to apprehend a criminal in the Arraial da Chapada, about forty leagues distant; the brother of this individual, one Raimundo Gomez, a mestiço, better known by the name of Cara preta (black face), and a party of nine other men whom he had engaged to assist him, disarmed the soldiers and sent them back; a greater number of soldiers were then dispatched by the Prefect to accomplish the same object, but by this time Raimundo had increased his band by a number of vagabonds who are never wanting in the interior, and who are always more ready to join in a disturbance, than to follow any regular employment; on this occasion the soldiers were again beaten back. In a short time, this band was greatly augmented by the desertion of slaves, by Indians, and others, who now commenced a regular system of pillage, attacking the Fazendas, and taking away whatever they pleased. As soon as the President of the province was informed of these circumstances, he dispatched a troop of about three hundred soldiers to disperse these robbers, but by some mismanagement, after having encountered them at Chapada, their ammunition failed, and they were obliged to surrender themselves into the hands of Raimundo; the lieutenant-colonel who commanded them, and a captain were put to the sword, but the rest of the officers and soldiers had their lives spared, on condition that they consented to join the insurgents; and it is said that the greater part did so with good will.

Raimundo thus strengthened, now regularly organized his party, appointing the officers he had captured his secretaries, as neither he nor any of his own partizans could read or write. It is pretty certain that about this time, he entered into correspondence with a party in the city of Maranham, which being opposed to the monarchial form of government wished its overthrow; from this source it is said that both arms and ammunition were secretly supplied to Raimundo's troops.

They now took up their quarters at a place called Brejo, rapidly increasing in numbers, principally by runaway slaves from the large cotton plantations in the neighbourhood. In the month of April, 1839, this united force amounted to about 5,000 men, the principal officer, besides Raimundo, being an old Indian, known by the name of O Balaio (the basket), from his having formerly gained a livelihood by making baskets, and selling them in the streets of Cachias. Being well armed, the rebel army, as it was called, marched to Cachias with the intention of taking it; at this time there were only about twenty soldiers in the town commanded by a lieutenant, but all the inhabitants rose in arms to defend it. The rebels besieged the place for about six weeks, allowing no provisions to enter, at the end of which time, the inhabitants being in a state of starvation, and unable to hold out longer, were obliged to capitulate on the 30th of June; the terms of this capitulation were, that all the military stores in the place, amounting to 5,000 stand of arms, and 800 barrels of gunpowder, should be delivered up, and a sum equivalent to seventy per cent. on the goods of each merchant and shopkeeper, be paid immediately;

The Prefect and several other leading men in the town also, in terms of the capitulation, declared prisoners, and kept in close confinement for several months.

As these disturbances took place principally to the north of Oeiras, I had still hopes of being able to proceed to the westward, but just as I was making preparations to leave, several persons arrived in Oeiras from Pastos Boms, a small town a little to the west of the Rio Parnahiba, exactly on the route I had intended to follow. I learned from them that a party of the rebels had been sent from Cachias to take that place, where five Portuguese and one Brazilian, who were known to be opposed to them, had been massacred, and their families robbed of all their property. News now reached Oeiras that Raimundo and his army, flushed with their success, were about to march from Cachias to take that city. The Barão de Parnahiba, who previously had been raising troops to send to the succour of Cachias, now redoubled his exertions, and the city became filled with rustic troops, undergoing the necessary process of drilling; these formed a very motley group, being of all sizes, of all colours, and variously dressed, most of them appearing in their leathern hats, jackets, and trowsers. As there were no symptoms that the rebels would soon make their threatened attack on Oeiras, about 600 of these troops were dispatched early in the month of July, under the command of Major Clementino Martins, the Baron's nephew, to join others, ordered to march from Ceará and Pernambuco, to the succour of Cachias. As soon as the rebels received notice of this movement, a general sack of the town took place, by about a thousand men, who still

remained there, on which occasion many of the inhabitants for the most part Portuguese, were murdered. It was not till the month of January, 1840, that Cachias was finally restored to order, and still later before peace was established in Pastos Boms and Brejo. In passing through a ravine near Cachias, that had been fortified by the rebels, Major Clementino and nearly all his troops were cut off. It was calculated that from the beginning to the end of this insurrection, more than 5,000 men fell victims; this may be considered as an example of the outbreaks perpetually occurring in Brazil, which keep it in an almost continual state of disorder, and paralyze the energies of those who really wish well to their country.

Prevented in this manner from travelling westward, and unwilling to retrace my steps, I determined to proceed southward to Rio de Janeiro, through the great inland provinces of Goyaz and Minas Geraes, though but ill provided for such an undertaking, particularly in pecuniary matters, the state of the country rendering it impossible to receive money from the coast. I had, however, my profession to depend upon, and I knew that if much money could not be gained by it, a great deal of expense might be saved, for I had already experienced, that as a medical man, I was well received wherever I went. The country to the south-west being also in rather an unsettled state, I was strongly advised by the Barão de Parnahiba, as well as by other influential persons in Oeiras, not to pursue this proposed journey, as I should run a risk of losing my life by so doing; but my strong desire to pass through a hitherto unexplored

country, determined me not to listen to their advice, and I immediately set about making arrangements for undertaking it.

The large collections which I made between Crato and Oeiras, and in the neighbourhood of the latter place, I had intended to send to Maranham to be shipped for England, but this was now impossible, on account of the great distance between Oeiras and Pernambuco or Bahia; there is but little traffic between these places, and had it not been for a fortunate occurrence, there would have been no resource left but to take them with me to Rio. From Pernambuco I brought letters with me to Dr. Casimiro José de Moraes Sarmento, a young advocate, who held a small government appointment in Oeiras, his native place; with this gentleman I formed a very intimate friendship; besides being well educated, I found him possessed of a very superior intelligence, of much moral worth, and of great goodness of heart. He had brought with him from Pernambuco, where he studied, a fine library of Portuguese, French, and English works, of all which he generously allowed me the freest use. The moment I was preparing to leave Oeiras, he suddenly determined to return to Pernambuco, and kindly consented to take my collections with him, which being packed in such a manner as only to form a single load, I dispatched on one of my own horses.

As far as I could learn, only one Englishman had visited this part of the country; several of the inhabitants still remembered Drs. Spix and Martius, and the house in which they resided was pointed out to me by the old Barão, who was then, however, a person of but small

note in the place. During the four months I passed in this city, I met with the greatest civility and hospitality from all classes of society, much more, indeed, than in any other place in the Empire in which I resided for any period. The Barão was particularly obliging, for besides providing a house for me, he sent my horses to one of his Fazendas to graze, and I was a frequent guest at his table; he dines quite in the old baronial fashion, his table which is very long, extending from one end to the other of a large room. He himself sits in a chair at the head of it, and his guests are seated on long forms placed on each side, the lowest places being often filled by his commonest shepherds. Captain Antonio de Moraes, the father of my young friend, and Captain Faria, I particularize among a host of others to whom I am indebted for innumerable services; indeed, I shall ever look back on my stay in Oeiras, as one of the most pleasant portions of my pilgrimage in Brazil.

On the afternoon of the 22nd of July, we bade adieu to the city of Oeiras, and commenced our overland journey to Rio; a journey which, though both tedious and painful, yielded me a far more abundant harvest of novelties than I anticipated. It was my intention to have left in the morning, but while preparing to do so, one of the men I had engaged to go as far as the southern extremity of the province of Piauhy, came to inform me that he had changed his mind; I instantly applied to the Barão for his assistance in procuring another, and as soon as he learned what had occurred, he sent for the man, who still refusing to go, was sent to prison. He then kindly informed me, that he would allow me the use of a soldier,

and having sent for one, told him that if he served me faithfully, he would give him his discharge on his return; I did not much like the look of this man, his face having one of the most cut-throat expressions I ever saw; I had no help but to accept his services, though in the end I was glad to get rid of him, as he proved to be one of the most insolent, lazy, and sulky fellows I ever had in my service. Captain Moraes and several other of my friends accompanied me for about a league from the city, when, with their hearty wishes for a safe return to my native country, we parted. About a league further we encamped for the night, under some large trees by the side of a small stream.

Our route was now nearly in a southerly direction, and lay through a beautiful country, consisting of diversified and park-like scenery. Many large flat tracts occur, to which the name of Chapada is given; these are but thinly wooded, the trees consisting of the Cashew (*Anacardium occidentale*), Jatoba, (*Hymenæa*), Parahiba, (*Simaruba versicolor*), and the Folha largo, (*Salvertia convallariodora*) a beautiful tree with large leaves, and spikes of sweet-smelling flowers, not unlike those of the horse-chesnut. As the weather was now quite settled, we generally slept in the open air at night, slinging our hammocks between trees. At a short distance from Oeiras, we passed through some of the national Fazendas, and on one of them had an opportunity of seeing the method adopted by the vaqueiros for catching the cattle, which roam about in large herds nearly in a wild state. In the southern provinces, it is well known that the cattle are caught by the lasso and bolas, the open country of those districts allowing

their free use, which is not the case in the north. The instrument used here, is a slender pole about nine or ten feet long, a little thicker at one end than at the other; into the thicker end, a quadrangular pointed piece of iron is fixed, projecting only about half an inch; mounted on horse-back, with this pole in his hand, the vaqueiro selects with his eye the animal he wishes to take, and pursuing it at full gallop, he soon overtakes it, and striking it on the hip with the armed end of the pole, while it is going at full speed, he easily upsets it, and before it can rise again, the vaqueiro has dismounted, and secures it; in this manner nearly all the cattle are taken in this province. There are no fences between the different properties, but every Fazendeiro has a brand, with which all his horses and cattle are marked before they are allowed to roam at liberty, and by which they are, of course, easily recognized. The cattle of Piauhy supply for the most part the markets of Maranham, Bahia, and Pernambuco; droves are also occasionally sent into the province of Minas Geraes; they are generally of a large size, and vary very much in colour, though brown is the prevailing one; their horns are long, pointed, and wide-spreading. We stopped a night at one of these national Fazendas, which was entirely devoted to the rearing of horses, and the principal vaqueiro informed me that it produced annually about 400 foals. The horses of Piauhy are in general small, and not long-lived, seldom exceeding ten or twelve years; those used on the cattle farms, owing to the violent exercise of hunting the cattle, do not last long. The riding horses are broken in with great care, and some of the paces which they are taught are very pleasant;

they are never shod, and this is less necessary here than in many of the other provinces, for the roads are generally level and soft. The price of a good working horse, that is, one fit for carrying a load on a journey, is seldom more than three pounds.

We were now in the country to which the name of Campos Agrestes is given in Piauhy. These Campos are partly open, and partly wooded; the open tracts are covered with coarse perennial grasses, and are not entirely destitute of trees, but all are more or less deciduous, with the exception of one which is truely evergreen; this is a species of *Zizyphus*, known by the name of Joazeira; it is not a large tree, but has wide-spreading branches that give an excellent shade, of which we often took advantage during the heat of the day. The cattle also are very fond of the shade of this tree, as well as of the sweet fleshy fruit, about the size of a small cherry, which it produces in great abundance, and which when ripe, falls to the ground; this fruit, called Joá, is also eaten by the inhabitants. Many of the trees of these tracts, have a stunted appearance, their branches being gnarled and tortuous. Sometimes large swampy tracts exist in the Campos Agrestes, and in these grow clusters of Buriti palms, the soft fruit of which is the principal food of three beautiful species of Maccaw which frequent them in great numbers. These birds generally fly in pairs, and rend the air with their loud cries of ará, ará, ará, and hence the Indian name of Arára. One of the most common of these is entirely blue (*Psittacus hyacinthinus*, Lath.); the others are blue also, with the exception of their breasts, which in one of them is orange, while the other has it of a crim-

son colour. Many of the level Chapadas where the soil is of red clayey character, are covered with numerous ant-hills, often six or eight feet high, which have the appearance of clay huts when seen at a distance; these are formed by the white ant, and as these insects constitute the principal food of the Ostrich of the country (*Rhea Americana*), and the great ant-bear, the Tamanduá of the natives (*Myrmecophaga jubata*), we saw many of them in the neighbourhood of the ant-hills. In the more closely wooded districts, the trees very much resemble the Catingas of the Campos Mimosos, and like them are deciduous in the dry season.

On the afternoon of the 29th of July, we reached a little hamlet called Algodoes, distant thirty-four leagues from Oeiras, where we remained for a day. We halted in the morning, and breakfasted at a Fazenda called Pombas, about three leagues from Algodoes, and when we left, a fine large mastiff dog that accompanied us, and which had been presented to me by Captain Moraes, was not to be found; this appeared the more remarkable, as he had become very much attached to us all. I thought he might have gone into the woods after some animal, and would soon follow us, but as he did not appear on the following morning, I sent Mr. Walker back to make enquiries about him, when the vaqueiro told him he had not been seen since we left; I strongly suspected at the time that this man, who was the only person on the farm, had stolen him; nor was I mistaken, as several days afterwards I heard from a person who passed a night there, that he saw the dog tied up, and was told by the vaqueiro that he had been presented to him by an English-

man who was going up to Minas. At about a league beyond Pombas we arrived at a large fresh-water lake two leagues in length, but not more than a quarter of a league in breadth; it terminates at Algodoes; and nearly all along its whole length, it is bounded by a belt of Carnahuba palms; the road led by the side of it, and we frequently came suddenly upon some large alligators (Jacaré) which were basking in the shallow water by the margin. We also saw many Capibaras (*Hydrochærus Capybara*), one troop of which, consisting of upwards of fifty individuals, crossed the path about a hundred yards before us, and entered the water; they crossed the lake by swimming, and we saw them land on the opposite side. Many parts of the lake were covered with the large floating leaves of a water lily (*Nymphæa*), which unfortunately was not in flower. During the night we heard the Capibaras plunging in the lake quite near to the house in which we slept; and I was told they are seldom molested, as their flesh is not good to eat; they are, therefore, very tame in this neighbourhood. Wishing to procure a specimen for the sake of its cranium, I went out early in the morning with my gun, but after walking nearly half a league along the side of the lake, not one was to be seen; we saw, however, plenty of alligators, and a very large one, which was floating like an old log on the surface of the water, at but a little distance from the shore, was too tempting a shot to be passed by; I fired at his head, my gun being loaded with large shot, when making a spring for the deep water, it turned upon its back and floated, apparently dead. Believing it to be so, I sent in Manoel, my Indian servant, to bring it out; he waded up to his chin in

the water, and attempted to seize the animal by the tail, when it turned suddenly round and disappeared. I know not which of the two was most frightened, for Manoel gave a loud roar, and lost no time in getting to terra firma: the animal had evidently only been stunned by the shot.

In this lake I found some curious aquatic plants, such as a new species of *Cabomba* (*C. Piauhyensis*, Gardn.), a fine yellow-flowered *Jussiæa* (*J. sedoides*, Humb.), first found by Humboldt in lakes in new Granada; it floats on the water, and the leaves which are small, all reach the surface, and form round the axis of the plant a dense circle, which at a distance appears like a large entire floating leaf. Specimens of a *Chara* and a *Potamogeton* were also collected; both interesting, from belonging to genera common to South America and Great Britain.

On the 31st, we left Algodoes early in the morning, and after a ride of about three leagues, over a dry flat Chapada, we arrived at Golfes, a single house situated on a hill near a small marsh, in which grows a great number of Buriti palms; we halted by the side of this marsh, under a large Cashew tree, In the afternoon, another journey of two and a half leagues, brought us to a small uninhabited house, at a place called Retiro Alegre, situated in a beautiful valley, skirted by high hills, and abounding in Buriti palms, the leaves of which afforded shelter to vast numbers of the orange-breasted Maccaw (*Canindé*). At this place I found a little black fellow, waiting my arrival to act as guide to the next Fazenda (Genipapo), which was five and a half leagues distant. He was sent by Captain Valentim Pereira da Silva, whom I met at Algodoes, on his way to visit his son, to whom the country

through which we were then passing, belonged. When this old man knew that I was the person who had performed several cures in Oeiras, he was very desirous that I should visit his son, who was in a bad state of health; and as his house was only a few leagues out of our direct course, I consented to do so. About half a league from the Fazenda the son himself met us. The estate of Genipapo belongs to him, and we remained there for the night; but he went to another, two leagues further on, called Canavieira, at which he himself resides.

On the following morning we arrived at Canavieira in time for breakfast, and had a very hospitable reception from the captain and his son; upon examination, I found the latter labouring under the incipient symptoms of consumption, and prescribed for him accordingly. It being seldom that a medical man is seen in this part of the country, I had many other patients to prescribe for, some of whom came from a considerable distance. At about a quarter of a mile beyond Genipapo, we arrived at the banks of the Rio Gurgea, which takes its rise in the southern extremity of the province, and falls into the Parnahiba, a little below the parallel of Oeiras. As is generally the case with the rivers in the northern provinces, the banks of this are more densely wooded, and more verdant in appearance, than the rest of the country. I remained with my hospitable friends all that day, and received an invitation to accompany them on the following day to a Fazenda eight leagues distant, belonging to the son's father-in-law, whither all the family were going, as the Visitador was on his triennial tour, and was expected

there about this time. This place also being but little out of our route, I accepted the invitation.

On the morning of the 3rd of August we left Canavieira, and, after a ride of about three leagues, crossed the Rio Gurgea, and entered the district of Urusuhy. The river here was about the breadth of the Clyde at Glasgow, but so shallow, that it did not reach much above the horse's middle. After riding another league, we arrived at a house belonging to a vaqueiro, where we halted to take breakfast, and to remain during the heat of the day. The house was situated in a hollow, and being shut out from the breeze, the heat was quite intolerable. The thermometer in the shade rose to 98°, and I suffered dreadfully from headache. We did not leave this place till four o'clock in the afternoon, and having still four leagues to travel, we reached the Fazenda dos Prazeres a little after sunset. With the exception of the banks of the river, the whole country through which we passed, was very much dried up for want of rain.

Our party was rather a large one. Besides ourselves, there were the captain, his son and lady, and a mulatto girl carrying their child, which they were taking to get baptized, three of the captain's nephews, and a black schoolmaster, all from top to toe in leather dresses; and, besides the blacks on foot who were bringing on the loaded horses, there were three on horse-back acting as attendants. The lady and her girl were both mounted on men's saddles, according to the common custom of the country in the interior. The black schoolmaster was decidedly the most superior of his race that I ever met with. He was a creole, with a fine expansion of forehead,

and had received a good education; he was a freeman, and his colour did not prevent him from mixing in the best society in the part of the country to which he belonged; indeed, the Brazilians are perhaps more free from those prejudices than any other nation. He was possessed of an immense fund of wit and humour, the continual flow of which kept the whole party in good spirits during the journey, notwithstanding the great heat of the day.

The Fazenda dos Prazeres stands on a rather elevated knoll in a large valley, which, at its upper extremity, is marshy and full of Buriti palms. On the dry sides of the low hills which surround the valley, there are large forests of that palm called Palmeira, already spoken of as being common about Crato; and in the Catinga forest, which we rode through, one or two smaller kinds of palm were common. One of these had its stem forked at the summit, being the only instance of the kind I ever met with; the central bud had been destroyed by some means, and two more arms generated in its stead. The house is large, well constructed, and by far the best we had seen since leaving Oeiras. The owner of it, who died suddenly about a year before, seems to have been not only more industrious, but a person of much greater taste than the generality of the Piauhy Fazendeiros. Around the house, and also to a considerable distance from it, there were many fine orange trees loaded with fruit, which being very rare in this province, were highly prized by us. There were also near the house, large plantations of plantains and bananas, as also several fine cocoa-nut trees, which were beginning to bear fruit. These trees were

the most distant from the coast I had met with in the country; and indeed it is but very seldom they are seen in cultivation inland, the tree being essentially of sea-side growth. The estate is principally a cattle farm, but in the valley below the house, there was a large patch of cane growing, from which they manufacture rapadura; and the soil being favourable for the cultivation of mandi-occa, a good deal of it is also grown. The widow, who with her sons now manages the farm, is both active and intelligent, and very hospitable. We remained here two days, during which time many people arrived from various quarters in the neighbourhood, to avail themselves of the services of the Visitador. Before we left, our provision boxes were well filled; and a large supply of oranges which we took with us, lasted for many days, and formed a grateful refreshment on our journey.

Recrossing the Rio Gurgea at a place called Flores, about sixteen leagues above the Fazenda dos Prazeres, and travelling for ten days in a southerly direction, more or less parallel with that river, we arrived at a small hamlet called Rapoza. The country we found to be very level, and generally of an arid nature, particularly when we were obliged to travel at some distance from the river, for its banks are for the most part well wooded, the trees consisting of the Jatoba Piki, several species of *Laurus*, large *Bignonias*, which at this season were covered with their bright yellow blossoms. Among these grew many climbing shrubs, such as *Bauhinias*, *Combretums*, *Bignonias*, *Malpighias*, &c., whose branches, covered with their many-coloured flowers, gaily adorned the wide-spreading tops of the trees. Numerous large wild fig-trees also

grow along the side of the stream, which often afforded us shelter both by day and by night. It was quite refreshing to travel under this shade, and we found it the more so, as the country around produced only a few leafless trees, and the soil, which was of a brick-red colour, had its herbaceous vegetation quite destroyed. During this season, the cattle frequent the margins of the river, both on account of the water, and the grass and other herbage which grow there; but this year, the latter had been nearly destroyed by the great rise of the waters during the previous rains, which were said to have been heavier than any that had occurred since the year 1820. We could see by the marks on the stems of the trees, left by the muddy water, that it had risen ten feet above the level of the road.

At Rapoza I met with Major José Martins de Sousa, to whom I carried letters from his uncle the Barão de Parnahiba. His house was about thirty leagues distant, but having been ordered to raise troops to send to the city, he had made this place the general rendezvous. About four years before this period, he bought a tract of ground, in the district of Parnagua, amounting to about ninety-six square leagues, for five Contos de reis, which he divided into six cattle farms, all of which were now in a flourishing condition. He told me that in the district, of which he was Prefect, there were 1,700 men capable of bearing arms, but all he had been able to raise in the course of a week, were twenty-two. The whole population, he added, were worse than savages, and that no eloquence could prevail on them to rise in defence of their country. He was even afraid that disorders, similar to those which

were disturbing the province of Maranham, would not be long ere they reached this district; and he said it was his intention as soon as possible, to take his wife and children down to the city. This, I believe, he shortly afterwards did, and it was well for them that he had this foresight, as about a month after I met him, the district of Parnagua rose to join the rebels, and the Major, who remained behind, had a very narrow escape from falling a victim to the fury of the inhabitants, and the cattle on his estates were nearly all destroyed. During his journey from Rapoza to the city, all his recruits deserted, with the exception of two or three.

A journey of fourteen leagues brought us to the Villa de Parnagua, the most southern town in the province, the country still continuing flat, and very similar to that through which we had already passed. The whole journey from Oeiras, presented little that was interesting in a geological point of view, the only rocks which occurred being of the same character as those existing in the vicinity of the city itself. The peculiar construction of the houses on the road, so very different from those met with in any other part of Brazil, or even in Piauhy itself, attracted my attention: they are built for the most part with one of their ends to the road, and in this end there is a large apartment with a table and a form, evidently intended for the accommodation of travellers, as it has no direct communication with the rest of the house. The door of the part inhabited by the family, is in the other end, and on this account it is very seldom that any of the females of the family are seen, they being kept strictly secluded. Should the house stand parallel to the road,

then the door to the travellers' apartment opens in front, while the door and windows of the other apartments are all in the back part. A stranger may thus live at one of these houses for many days, without the slightest knowledge of what is going on within. The ladies are not, however, destitute of curiosity, as I have frequently detected a pair of black eyes peering through some slit in the fragile partitions to get a peep at the strangers. Yet, as a professional man, it was seldom I was not admitted, being called in to prescribe for some one or other of the females of the family; the sedentary life which they lead rendering them very subject to dyspeptic and such like complaints. Ague is also very common indeed, and nearly all the inhabitants suffer from the effects of it. Mr. Darwin, in his Journal, mentions that there are few houses in Chili where a traveller will not be received for the night, but a trifle is expected to be given in the morning, and that even a rich man will accept two or three shillings. In Brazil this is very different, on the road from Rio de Janeiro to the Mining Districts, which is now very much frequented, there are always houses to be found which serve as apologies for inns, and in which the traveller is expected to pay; but should he put up at any of the large Fazendas he is allowed to sit free at the table, paying only for such provender as his animals may require. In the more distant parts of the country, I always met with the most unbounded hospitality, even from the poorer classes, and often the only recompense which these poor beings would accept was a little gunpowder or salt, articles which very often are not to be procured at any price.

When I left Rapoza, Major Martins gave me a letter to the Juiz de Paz of Parnaguá, and a note to receive the keys of an empty house in which he puts up when he visits the Villa. On our arrival, I found that the Juiz had gone to visit his Fazenda, at a distance of six or seven leagues. The Vicar and the other Padre of the place were also absent, visiting their district. An old lawyer, the schoolmaster, and a shopkeeper were the only persons of consequence we found in the place. The Villa, which is situated on the east side of a large lake, contains in all about a hundred houses, but not more than one half of them are inhabited, as many belong to Fazendeiros who only occupy them during the festival times. Owing to the recruiting which was then going on throughout the province, the greater part of the male population had left the Villa and gone to distant places, few being inclined to join the army; women and children only were to be seen, with the exception of a few slaves. The houses are generally built of a coarse wicker work, and plastered, both inside and out, with a red-coloured clay, which, not being white-washed, gives the town a very strange appearance. The best days of the place seem to have gone by, as many of the houses are falling into ruins; and the church, which stands in a large square and has once been a neat building, is also going to decay, one half of the roof has fallen in, and it seemed to have been in that state for some years. There is not a single regular shopkeeper in the place, the only one that we found there, had arrived some time before from Bahia, and proposed to return as soon as he had sold his goods. Having no competitor, he took advantage of this, and

was selling everything at a very exorbitant price. The people, both in the Villa and in the neighbouring Fazendas, complained that the revolution in Maranham had prevented the merchants, who yearly visit them, from coming to Parnaguá. These were in the habit of bringing up European goods, salt, gunpowder, &c., which they generally exchanged for horses, cattle, and hides.

Salt is an article for which there is a great demand, and the people in the Villa have found out a substitute for that which comes from the coast. Along the banks of the lake, the soil in many places is highly impregnated with saline matter, which, although mixed with saltpetre, is yet very acceptable where no other can be procured; during our visit, many people from very distant parts were occupied in collecting this salt. The manner in which they obtain it is as follows; the soil is cleaned of grass and other herbaceous vegetation, and on being moistened with water, the part richest in salt soon shows itself by the appearance of small crystals. This earth is then scraped up with the scapular bone of an ox, and put into a trough made of a cow-hide, supported upon four short posts fixed into the ground. Water is then poured on the earth, which, during the space of a day, is allowed to filter slowly through small holes in the bottom of the trough, when it is received into a large basin placed below it: the process is continued till the salt is all extracted. The water thus extracted is either put into smaller hide-troughs and evaporated in the sun, or boiled down in an iron pot, but as these are rather scarce articles in Parnaguá, few only can have recourse to this

mode. The salt is not very clean, but a quantity which I bought was found to preserve meat very well.

The lake, near which the village is situated, is about two leagues long, and one broad, but it is said not to be deep; it is always of a red colour, caused no doubt by the soil of the surrounding country, which is everywhere of a deep red-coloured clay. It is said to abound in fish, but during our stay I could not obtain any. Great numbers of large Alligators exist in it, as also Boa Constrictors, Capivaras, and Tapirs; I saw, besides, some large Otters, but could not come within shot of them. After we arrived I went to bathe in the lake, and swam out a long way, but did not do so again, on being told that several accidents had taken place, not only from the attacks of Alligators, but also from Piranias.

With the exception of a small Serra to the south-east, the country around the Villa is flat, and but for the lake, it would have a very unpicturesque appearance. I took several walks in the neighbourhood, but in consequence of the long-continued drought, I did not meet with much to reward my labour. In a marsh, which in the rainy season forms part of the lake, I found two species of water-lily (*Nymphæa*), both small and bearing white flowers, one of them smelling very sweetly, while the other had exactly the fœtid smell of coal-tar. On the Serra I found a small leaved *Gomphia*, a *Trixis*, and a tree lily (*Vellozia*); the latter was not in flower, as was the case with one I found at Oeiras. These are the two most northerly stations in which I have met with species of this genus, whose great focus lies in the mountains of the Diamond District.

CHAPTER IX.

PARNAGUA TO NATIVIDADE.

Leaves Parnaguá—Arrives at Saco do Tanque—Carrapatos a great pest to Travellers and Cattle—Vegetation of the Country—Crosses the Serras da Batalha and de Matto Grosso, the boundary of the Province of Piauhy—Descends into the district of Rio Preto—Account of the Cherente Indians—Arrives at Santa Rosa—Crosses the River Preto—Reaches the desolate Region of Os Geräes—Passes over the elevated table-land Chapada da Mangabeira—Arrives at the Indian Mission of Duro—Description of these Indians—Reaches Cachoeira, Crosses the Serra do Duro—Fords the River Manoel Alves—Arrives at Almas—Galheiro morto—Morhinos—Abundance of Wild Honey—Description of several kinds of Bees—Reaches Nossa Senhora d'Amparà—Mato Virgem—Goitre not uncommon—Passes Sociedade—Arrayal da Chapada—And arrives at Natividade.

It was with much difficulty that I procured in Parnaguá a person to replace the soldier who accompanied us from Oeiras; chance threw in my way a mulatto, who having come with a large drove of cattle from the province of Goyaz, was therefore acquainted with the tracks through the unfrequented country into which we were now about to enter. We left Parnaguá on the 29th of September, and continuing our journey nearly in a southerly direction, we arrived at a little Fazenda, called Saco do Tanque, on the 7th of October, the distance being about twenty-six leagues. It was late in the afternoon when we left Par-

naguá, and being nearly dark by the time we reached the head of the lake, we halted there for the night under some trees. Towards morning we felt so chilly in our hammocks, that we were glad to get up and warm ourselves at a large fire, which the men kept burning all night. As we rode along the side of the lake, we saw several Capivaras and Alligators, which upon our coming near them made for the water.

Shortly after leaving Oeiras, we began to be much tormented by a species of tick, to which the Brazilians give the name of Carrapato. These insects abound in dry bushy places, where they attach themselves to the slender twigs; at first they are very small (Carrapatos miudos), and may be seen in clusters consisting of many hundreds; these as soon as any animal passes by and touches them, instantly adhere to it, burying their suckers so deeply into its skin, that it is only by using considerable force they can be withdrawn. If not taken off they go on increasing in bulk till they become as large, and even larger, than a common horse-bean; they even increase in size on the grass and bushes, but then have a lean flat appearance; it is to this form that the name Carrapato grande is given. Spix and Martius believe the large and small kinds to be distinct species, but I think there can be no doubt that they are the same insects in different stages; St. Hilaire is of this opinion, and so are the inhabitants themselves. It is only in the beginning of the dry season that the small Carrapato is to be found in those districts which are infested by them, but as the season advances, they gradually disappear, to be replaced by the larger ones. They attach themselves indiscriminately to all kinds of

quadrupeds, but the horse and the ox suffer most from their attacks, and in very dry seasons they exist in such numbers, that whole herds of cattle perish from the exhaustion which they produce. If, however, the animal on which they live, can hold out till the rains set in, it soon regains its strength, as wet is very fatal to the Carrapato; I have frequently seen some of my horses that were infested by these creatures, get nearly free from them after swimming across a broad river. Some horses I found were much more subject to them than others. We found the dry bushy country above Parnaguá swarming with these pests, and almost every night, we had to pick hundreds of them off our bodies before we could turn into our hammocks. The men suffered more than either Mr. Walker or myself, as they were on foot, and their legs were bare from the knees downwards. When I walked out to botanize in the neighbourhood of the places where we encamped, I used generally to get completely covered with them, and had to change my dress, but by laying the infested articles in the bright sun-shine for a quarter of an hour they became fit to put on again; a favourite little ring-tailed monkey, which I obtained from an old Indian some days after we left Oeiras, also used to suffer very much from these insects. When full grown, a large Carrapato very much resembles the ripe seed of the Castor oil tree. In dragging off very large ones, the wound which is left often becomes a very bad sore. The Carrapato belongs to the genus *Ixodes*, of Latreille.

Although the country between Parnaguá and Saco do Tanque is comparatively level, yet there is a very perceptable rise; and although the general vegetation has very

much the same character as that of other Catinga districts, many of the shrubs and trees were quite new to me. At this season very few were in flower; of these the most remarkable, was a very large tree to which the name of Sicupira is given by the inhabitants, and which I afterwards found extending far into the province of Goyaz; it belongs to the natural order *Leguminosæ*, and has only very recently been described by Mr. Bentham, under the name of *Commilobium polygalæflorum*: it is easily recognized at a great distance by its numerous large panicles of lilac flowers. An essential oil which is contained in the fruit, is much used by the inhabitants to alleviate the pain of the tooth-ache. A very large silk cotton tree (*Bombax*), entirely destitute of leaves, was also common, but on one of them I found a few blossoms, which were of enormous size, measuring when fully expanded about a foot and a half across; the petals were of a dark brown colour without, but white within. Near a Fazenda called Riacho d'Area, where we stopped a day, grow a number of large palm trees, on the stems of which I found a large fleshy-stemmed Orchideous plant, a species of *Cyrtopodium*, which produced flowering stems about four feet high, terminating in a large panicle of flowers, with brown blotches on an orange ground, and smelling sweetly like wall-flower.

In marshy bushy places on this journey I saw many plants of the *Vanilla planifolia*, seldom bearing flowers, and more rarely producing fruit. It has now been satisfactorily determined, that this is the species from which the true Vanilla of commerce is procured. In Mexico it is extensively cultivated for the sake of its fruit, which it

yields abundantly; while the plants which have been introduced into the East Indies, and the hothouses of Europe, though they have frequently produced flowers, have very seldom perfected their fruit. Dr. Morren of Liége was the first to study attentively the natural history of this plant, and to prove experimentally that the fruit of the Vanilla may be as freely produced in our hothouses as it is in Mexico. He has discovered that from some peculiarities in the reproductive organs of this plant, artificial fecundation is required. In the year 1836, a plant in one of the hothouses in the botanic garden at Liége produced fifty-four flowers, which having been artificially fecundated, exhibited the same number of pods, quite equal to those imported from Mexico; and in 1837, a fresh crop of about a hundred pods was obtained upon another plant by the same method. He attributes the fecundation of the plant in Mexico, to the action of some insect which frequents the flower; and hence accounts for the non-production of fruit in those plants, which have been removed to other countries. There can be no doubt that this plant is as perfectly indigenous to Brazil, as it is to Mexico; but it is no less certain that its fruit is there seldom matured. Is this also to be attributed to the absence of the means by which nature is supposed to effect fecundation in Mexico? This is a subject, which, as Professor Morren justly observes, well deserves attention in a commercial point of view, since his experiments go to prove, that in all intertropical countries, vanilla might be cultivated, and a great abundance of fruit obtained*.

* See Professor Morren's paper "*On the production of Vanilla in Europe*," in *Taylor's Annals of Natural History*, vol. iii. p. 1.

The country in which we were travelling, is much infested by the Onça of the inhabitants, the *Felis onça* of Linnæus, which is also known by the name of Jaguar. In our encampments, we used to hear them night after night roaring at some distance, but they never came near enough to be seen. The night we remained at Riacho d'Area, we were prevented from sleeping during the early part of it, by the loud roaring of one of these animals, which was so distinct and audible that it appeared to be within a short distance; but the Fazendeiro, who was more accustomed to the sound, assured me it was at least half a league distant, and from its noise he supposed it to be a very large male; its roar was more like the growl of an angry dog, which generally continued for a quarter of an hour at a time, when it terminated by a sound, two or three times repeated, not unlike the smothered bark of a large mastiff. The dogs belonging to the Fazenda were on the alert and barking, but none of them offered to leave the house. My horses which were feeding at a little distance, came closer to us, when they heard the almost unearthly sounds produced by the fierce inhabitant of the forests; even those I had brought from the coast and which I am certain had never been exposed to the attacks of these animals, followed the example of the others.

The Fazenda de Saco do Tanque is situated immediately on the boundary line between the province of Piauhy, and the south west portion of that of Pernambuco, which is known by the name of the District of the Rio Preto. Shortly after entering this district, we reached an elevated table-land, called the Serra da Batalha, which it was

necessary to cross; it is about the height of the Serra de Araripe at Crato, and like it, is covered with an ever-verdant vegetation. The ascent is a very rugged one, consisting of large blocks of coarse white sand-stone, of which the Serra appeared to be composed. At the foot of this Serra, and on the ascent itself I made one of the finest collections of plants I had yet met with since leaving Oeiras. In moist sandy places at its foot grow some of these beautiful large-flowered small-leaved *Melastomaceæ*, which are so abundant in the Gold and Diamond districts; while on the more elevated sandy tracts I found immense quantities of a kind of nutmeg (*Myristica*), which does not grow more than three feet high. The trees on the Chapada itself, consisted chiefly of the Cashew, Piki, Jatoba, Mangaba, Sicupira, *Gomphia hexasperma*, and an arboreous *Bignonia*; but intermingled with these, there were many beautiful trees and shrubs, which I had not before met with. After crossing the Chapada which is three leagues in breadth, the descent is very gradual and ultimately merges into a marshy plain abounding in Buriti palms. The whole country here bore a very different aspect from that we had left behind us, the vegetation being fresh and verdant, which was a great relief to the eye, after having been so long accustomed to leafless trees, and a bare soil of red clay. The woods were all evergreen, and between the clusters of the noble Buriti palms and the wooded parts of the country, there were large open marshy Campos covered with grass, and other herbaceous vegetation common to marshy tracts.

We were now in a country much infested by the incursions of wild Indians, and many of the more solitary habi-

tations had, some time before our arrival, been abandoned by their possessors on that account. After riding about half a mile along the side of the first open tract we came to, we reached one of these deserted dwellings, and a little beyond it, we put up in another also uninhabited. At Saco do Tanque, we were informed that these houses had been abandoned in consequence of an attack which the Indians had made on another, a few months before, a league or two to the westward, when all the inhabitants were put to death. As I had many of my recent collections to put in order, and as this appeared a favourable spot for botanizing, I remained here a day. There was also good pasture for the horses, and they, as well as ourselves, had need of rest. I was not disappointed in the few short rambles which I took in the neighbourhood, as I met with several remarkable plants, quite different from any I had before seen; among these were an *Eryngium*, a *Jussiæa*, which formed a small tree about twenty feet high, a tree-fern, the only one I had seen since I left Crato, and a few curious *Eriocaulons* from the marshes. In the deserted house in which we took up our quarters, we were dreadfully annoyed both by mosquitos and chigoes (*Bich de Pé*).

Leaving Batalha, the name of the place at which we were encamped, a journey of three long leagues brought us to the Fazenda of Santa Rosa. We had not gone far when we had to ascend another Serra, but lower than that of Batalha, the top of which forms a Chapada about a league broad. Having crossed this, a very slight ascent brought us to the top of a third elevated plane, called the Serra do Mato Grosso, from the dense forest with which it is covered. These three Serras may more

correctly be considered as one great one, than as distinct ranges, since we found the descent from the last about equal in height to the ascent of the first, and both much greater than the intermediate ones; the south side also, like the north, was covered with large blocks of sandstone. We now entered the valley of Santa Rosa, which tends southward for about a league and a half; in the middle of this runs a small stream of the most limpid water I have ever seen, and on each side of it, grows a strip of tall and beautiful Buriti palms, affording food and shelter to vast numbers of the three kinds of Maccaw already described. Near the top of the valley there is a large lake, and another about the middle of it, fed by the small stream, partly surrounded by the Buriti, and partly by a much smaller palm which very much resembles it, but its stem is thickly covered by long sharp spines; this, which I afterwards found to be very common in the marshy Campos of the province of Goyaz, is called Buritizana. This beautiful valley is about a league broad at its widest part, where the Fazenda of the same name is situated, and is bounded on the north-west side by the Serra do Livramento, about equal in height with the Serra do Mato Grosso, which bounds it on the north-east side.

Shortly before we reached the descent of the Serra, the great variety of new plants which I found growing there, caused me to linger far behind the troop, but as this was very frequently the case, the men took no notice of it. I did not often keep one of them with me, as my eye, from long practice, had become well acquainted with the track of the troop, from the appearance of the horses'

and the men's foot-marks; and here, moreover, the road had been so long free from travellers, that there seemed no chance of any mistake occurring. In this, however, I was deceived, for although I traced them to the lower part of the upper lake, where the ground was very soft, and much trodden by the cattle and horses that came there to drink; beyond this muddy tract, which was of considerable size, I could not trace the foot-marks of my troop, although I spent a long time in trying to do so. It is well understood among travellers in these desert parts of Brazil, that, if one of the party should by any chance remain behind, and be unable to find the track of his companions, he is to remain in the immediate neighbourhood of the spot where he first lost it, so that he may the more readily be found by those who return to look for him. Acting upon this, and feeling certain that before night some one of my party would be sent in search of me, I returned to the foot of the Serra, and under some shady trees by the road-side dismounted, and tying the fore-legs of my horse with the bridle, so that he might feed, and not stray, I sat down under one of the trees to study attentively the plants which I had collected during my morning's ride. My only fear was lest any of the wandering tribes of Indians, who were known to be in the neighbouring woods, should happen to come across me, for in consequence of the persecution they have received from the Brazilians, they consider every white man they encounter lawful game to shoot at and destroy. It was not till late in the afternoon that Mr. Walker, finding I did not make my appearance, sent one of the men to look for me; and when we returned to the

place where I had been unable to follow the track, I found they had passed over to the other side of the lake by a very narrow path, which was completely covered over with long grass.

Finding the proprietor of the Fazenda of Santa Rosa, Senhor Antonio Jozé de Guimerãens, very civil and obliging, I determined to remain there for some days, to make the necessary arrrangements for entering upon a journey of upwards of forty leagues through an entirely uninhabited country. My collections made between Parnaguá and Santa Rosa, were to be arranged and packed up, and it was with considerable difficulty that I could find an additional horse to purchase. Our host had not one to part with, that would answer my purpose, but he kindly accompanied Mr. Walker to a Fazenda, about five leagues distant, and assisted him in procuring one. Our provision boxes also required to be replenished, and for this purpose an ox was purchased, and its flesh prepared by drying in the sun. No farinha was to be had at Santa Rosa, but our host went himself to another Fazenda about four leagues to the eastward, and bought me a load. We could not, however, purchase the hide boxes which were necessary for carrying my collections; these we were obliged to make ourselves, under the superintendence of Mr. Walker, who was very expert in all that related to the equipment of the troop. During the twelve days that we found it necessary to remain at this place, I lost no opportunity of adding to my collections, by excursions in the neighbourhood, but particularly to the Serras which form the boundaries of the valley. One of the finest trees I ever remember to have seen standing alone, grew by the side

of a small brook, which flowed at a little distance from the house; it was a species of *Qualea*, with a clean straight stem about one hundred feet in height, on which it supported a wide-spreading top of branches; as it came into flower shortly after our arrival, and as there was no way of obtaining specimens than by cutting the tree down, Senhor Guimerãens himself proposed to do so, as soon as he knew I wished to possess a few specimens. After about two hours labour on the part of himself and two of my men, this fine tree, which I was sorry to see destroyed, come to the ground with a tremendous crash.

It was on the morning of the 21st of September, that we left Santa Rosa, and a journey of nearly three leagues, brought us to the north bank of the Rio Preto, a stream which gives origin to the name of the district, and which takes its rise on the eastern side of the Serra do Duro, and falls into the Rio de San Francisco a little above Villa da Barra. Following the course of this river downwards for about a quarter of a mile, we arrived at the ferry which leads to the Fazenda of Santa Maria, which stands on the opposite side. At this place the river is about thirty yards broad, is very deep, and the current is very rapid; at a distance, the water appears black as ink, and from this circumstance it takes its name, but when close to it the water is so clear, that the bottom can be seen at a great depth; we could also see that it was inhabited by numbers of fine fish. Our luggage was taken over by an old Indian in a canoe, which was so small, that only one horse-load could be transported at a time. We took up our mid-day quarters under the wide-spreading branches of a large Cashew tree, but the shade

which this kind of tree yields, does not shelter well from the rays of the sun, as it is never very thickly covered with leaves. We all bathed in the waters of the beautiful stream, and rejoiced that for several days to come, we should still have this enjoyment, as our route to the westward lay along its margin. There is nothing so refreshing to the traveller in a tropical climate, as frequent ablution in cold water. We were not far from the house on which the outrage I have before mentioned, was committed by the Indians; the attack was made during the day, while the men were absent in the fields, and after burning the house, and killing three women, they carried off two children. The people at Santa Maria informed me, they lived in constant dread of the Indians, and that they had serious intentions of removing to a more populous district. These Indians live generally at a considerable distance to the north-west, only extending their excursions into this neighbourhood, when in pursuit of game, and are known by the name of Cherentes. It is supposed this attack originated in consequence of one of the Indians having been fired at, and wounded by mistake, who in revenge, had with the assistance of some of his countrymen, committed the outrage above mentioned.

The desolate tract of country, upwards of forty leagues in breadth, which we were now about to cross, in order to reach the province of Goyaz, is called by the people of the country, Os Geräes. It is seldom traversed except by drovers, who take cattle from the north of Goyaz to Bahia. There is however a path through it, and the mulatto I engaged at Parnaguà, having once traversed it, was to act as our guide. From him I learned that there

was only one habitation to be met with, a small hut, occasionally occupied by an old man, half Indian, half Portuguese; but this was of no importance to me, as I had laid in a sufficient stock of provisions for our journey. The stories he told of the Indians, alarmed my party very much; and I was in consequence obliged to get all my arms put in order, so as to make as formidable an appearance as possible. I carried a small brace of pocket pistols besides those in my holsters, and had a large sword-knife in my belt. Mr. Walker, besides the usual dagger-knife of the Brazilians, carried a small sword; and the men were each armed with a gun; happily we had no occasion to make use of our weapons. The country people have all a great dread of this wild and uninhabited tract, and before entering it, I was often asked if I was not afraid to do so with so few attendants. Their own fear is I believe greatly owing to their cowardice, a very common feeling in all parts of the country I have visited. My mind was too much occupied with the anticipations of the rich harvest of novelties I expected to meet with, to think much of these dangers; the whole country I had gone over since I had left the coast at Aracaty was virgin ground to the naturalist, with the exception of Oeiras, which was passed through by Spix and Martius on their journey from Bahia to Maranham.

We entered the Geräes on the afternoon of the same day we arrived at Santa Maria, but the first part of our journey was far from auspicious. Our route was westward along the banks of the Rio Preto, which was lined with Buriti and Buritizana palms, and numerous flowering shrubs. After we had gone about two leagues, the

sky to the westward became very black, and shortly afterwards distant thunder was heard. We halted by the side of the river under some large trees, but before we could get a shelter arranged the storm reached us. The lightning was very vivid, the thunder loud, and the rain came pouring down in torrents; by fixing up two large hides to the branches above us, they afforded a tolerable shelter. As soon as the storm passed over we enlarged our house, so as to have a place of refuge in case it should return, and it was well we did so, for having slung our hammocks as usual between the trees, we were aroused about midnight by a loud peal of thunder which broke right over our heads, and as the rain fell heavily we were obliged to take refuge in our house of hides. I thought there was something more awful in this storm than in any I had ever experienced, but this feeling was perhaps augmented by the solitude in which we found ourselves. It may be asked why I did not take a tent with me? I might have done so, but in travelling, I made it a rule to conform to the habits of the country, and in the north of Brazil no one ever thinks of carrying a tent. Long journeys are always avoided in the rainy season, and as the dry season generally lasts more than seven months, that period is selected always for this purpose. These thunder storms are invariably the precursors to the setting in of the heavy continual rains, but we hoped before that time, to reach some town in the north of the province of Goyaz, where we might halt till the proper season for travelling would again come round.

On the second day we made a journey of about six leagues; sometimes our route led through dense forests

by the side of the river, at other times through open grassy meadows in which grew clusters of the Buriti palms, and at intervals over slightly elevated flat tracts, covered with low bushes, and abundance of a large grotesque looking tree Lily (*Vellozia*) on which I vainly looked for flowers, as they are only produced in the dry season. We halted during the middle of the day, but only for a short time, at a rude hut of palm leaves, which had been erected by some previous travellers, by the wooded margin of a beautiful grassy meadow about a quarter of a mile square. Late in the afternoon the sky to the westward began to assume a lowering aspect, and shortly presented all the appearance of an approaching thunder storm. We pushed on as quickly as the nature of the road would allow, as our guide assured us that we were not far distant from the habitation of an old Indian. The lightning soon commenced, and the rolling of thunder was heard in the distance; gradually it came nearer to us, and the western sky from the horizon to the zenith was from time to time filled with one sheet of blueish flame, which while it lasted, rendered the close of the twilight almost as bright as day. Thanks to our good fortune, the storm did not then reach us, having been diverted to the northward; passing over a high Serra which lay in that direction, it again altered its course, and followed fast upon our heels. It was quite dark when we arrived at the solitary dwelling, and when I rode to the little gate in front of it, the owner came out with a gun in his hand. He immediately granted us permission to take shelter for the night in an open shed, and as soon as the luggage had been arranged in it, and a few large skins had been hung up on the

weather side, the storm broke over the hut in all its fury, accompanied by a gale of wind which quickly extinguished our lights, and we had reason to be thankful that the whole building was not carried away before it: uncomfortable as the place was, we rejoiced in having even such shelter as it afforded.

The old man informed me that he lived in constant fear of an attack from the Cherentes. He had been in this solitary place, for three years, but had now made up his mind to leave it in the course of a few months. His wife had been dead about a year, and he and three little children were the only inhabitants of the place. He had two houses, the best of which was at one end of the shed in which we were stowed, but he had never lived in it; the reason he assigned was, that the Indians when they attack a house, immediately set fire to it, and surround it, so that no one may escape. The hut in which he resided was at some distance from the other, and in appearance was but little better than a pig-sty, but he said that in case of an attack, he could very easily make his escape from it to the woods. He had a small piece of ground cleared by the side of the river, in which grew some mandiocca, Indian corn, cotton, and bananas. He possessed no cattle of his own, but I was afterwards informed that he was very expert in stealing oxen, from the droves which occasionally pass on their way to the coast.

Three days after we left this habitation, we arrived at a place where the Rio Preto divides the Province of Pernambuco from that of Goyaz. The country we passed through, was very similar to the first part of the Geräes, with the exception of the last four leagues of our journey

which lay through an undulating elevated region destitute of arboreous vegetation; the soil was of a white sandy nature, thinly covered with dwarf shrubs, and small dry tufts of grass: it was only here and there that a small stunted tree made its appearance among the bushes: as we approached the river, however, the country became more flat and better wooded. Notwithstanding the arid nature of this tract, its scanty vegetation was, with few exceptions, quite new to me. The moister sandy places afforded me several of those curious *Eriocaulons*, of which so many exist in my collections, one of these, which I found shortly before we reached the river, was a large branched species about five feet in height; these remarkable forms I afterwards met with in great abundance in the Diamond District, which is the great centre of the *Eriocaulons*, as it is of the *Vellozias*, or tree-lily tribe. The river, we here found to be about forty feet broad, and not less than from sixteen to twenty feet in depth; the current was still rapid, and the water so limpid, that the bottom could be seen quite distinctly. Several large Buriti palms grow on its banks, and the bridge by which we crossed, was one of these trees cut down, so as to fall across the stream. It was not without considerable trouble, that we got all our luggage taken to the other side, which when accomplished, the horses were swum over a little further up the river. At about two hundred yards from its banks we encamped under a large Myrtle tree (*Myrcia*), where we remained a day, for I found it to be an excellent place for my researches. In a marsh by the side of the river, I collected specimens of an *Isoetes*, which does not appear to differ from the

one which grows in Great Britain, (*Isoetes lacustris*, Linn.). The sight of this plant recalled pleasing recollections of long past times, and I could not refrain from indulging in a lengthened train of reflections, which ended by comparing it with myself—a stranger in a strange land, and associated with still stranger companions.

Our next journey, which was one of four long leagues, through an arid, undulating, sandy, thinly-wooded country, brought us to the foot of the Chapada da Mangabeira, an elevated level table-land nearly forty miles broad. On this journey we were dreadfully scorched by a burning sun; not a breath of wind was to be felt, and we all suffered very much from thirst, as not a drop of water was to be met with, and the men had neglected to fill the large leathern bag (Boracho) before we started. Shortly after leaving Oeiras, I was obliged to provide myself with one of these necessary articles; it held about two gallons, and when full, was carried between the two side loads of one of the horses. We encamped beneath a large Piki tree, not far from a spring of cool clear water which emptied itself into a large morass. As this is the last watering-place to be met with till the Chapada is crossed, the usual way of proceeding is to leave it about mid-day, and push on without stopping till half of the distance has been performed; and by leaving again early on the following morning, the next watering-place may be gained in the forenoon.

On the day succeeding that on which we arrived at the foot of the Chapada, we started to cross it about one o'clock in the afternoon. The horses were previously allowed to drink freely, and I took care that the leathern

bag was not neglected this time. After travelling about half a league, we entered by a gradual ascent upon the Chapada, and at the same time were overtaken by a thunder storm, which, however, passed over without wetting us much. After a journey of five leagues, we arrived at a place where there are a few small trees, and under them we halted for the night. For the first league and a half, the Chapada was thinly wooded with small trees, which become gradually smaller and thinner, till at last not one was to be seen; only a few stunted shrubs from a foot, to a foot and a half high, exist on this barren spot; and the only living thing we saw, was a kind of locust, about two inches long, which rose in clouds before the horses. Many skeletons of horses and oxen lay on both sides of the path, no doubt the remains of animals which on crossing this desert tract, had become exhausted, and died from want of water. After the thunder storm passed over, the sky became clear and unclouded, and the sunset was one of the most beautiful I have ever seen, its splendour, and the ocean-like plain over which we were travelling, reminded me of those I have so often seen at sea, between the tropics. The atmosphere, too, was delightfully cool, and heavily laden with the rich perfume of one of the small shrubs then in flower, which grew in the greatest profusion; this shrub, which I afterwards found to be the *Spiranthera odoratissima* of St. Hilaire, grows in small clusters, and bears large corymbs of pure white flowers larger than those of the honeysuckle, but not unlike them in shape, although their odour more resembles that of the Jasmine. Shortly after we reached our resting-place, the sky again became clouded towards the

west, and there was much lightning, which made us fear another storm. As usual we slung our hammocks between the trees, and contrary to our expectations, passed the night without rain.

We resumed our journey again as early as possible after day-break, and having accomplished five leagues more, the greater part of which was along one of the worst roads we had yet encountered, we halted under some large trees close to a marsh, on the south-west side of the Chapada. At about half a league from where we slept, the descent of the Chapada begins,and from thence a fine view of a large plain below is obtained, which is almost entirely surrounded by a chain of low hills, several of which to the south are of a conical form; the descent is very rocky, and on both sides of the road, stand a great many isolated columnar and wall-like portions, which give the traveller the idea, that he is passing through the ruins of a large city, destroyed by some great catastrophe. The rock is a conglomerate, and as many of the rounded stones of which it is composed, are of considerable size, this resemblance becomes the more striking. This side of the Chapada is entirely composed of a coarse sandstone, which in some places is much softer than in others, and the ruin-like portions have, no doubt, been formed by the disintegration of those of a softer texture. On the descent, we had often to dismount and lead our horses; one of the pack-horses fell, and rolled over several times before he could regain a footing. As soon as we reached the marsh, the horses rushed into the water to quench their thirst, before they could be unloaded, and although it was still early in the day when we arrived, I determined

to remain here till the following morning, so that they might rest. The evening was again cloudy, with thunder and lightning in the distance, which induced us to construct our hut of skins, that we might be sheltered in case of rain; but none, however, fell.

Early on the following morning, we started with the intention of going direct to Duro, an Indian mission, about four leagues distant, but when we were within about a league of it, we entered upon a wrong road, and had gone nearly two leagues, before the man who acted as our guide, discovered his mistake; it being then about the middle of the day, we halted to take breakfast under the shade of a large *Vochysia*, which overhung a spring of limpid water; but we had no sooner taken possession of this spot, than our right to it was called in question by some thousands of a small bee, not so large as a common house-fly; they came buzzing about in all directions, from the hollow stem of the large tree, in which they had their habitation; they had no sting, but they annoyed us very much, by flying about the face, and getting entangled in the hair. After kindling a large fire, they soon became less troublesome; the only one of our party who seemed to be much alarmed at them, was my little monkey, who when they came swarming about his head, covered it with his hands, and screaming fearfully, leaped upon me, and hid himself under my jacket.

The country over which we passed before reaching this place, is of an undulating character, consisting generally of large open campos, the soil of which is principally a white sand, and being but scantily covered with herbaceous vegetation, the glare caused by the bright sun-shine was

very fatiguing to the eyes. On these campos, as well as on the Chapada da Mangabeira, a dwarf cashew is very abundant, growing gregariously, and not more than a foot high; I found it both in flower and in fruit, but the latter is not much larger than a gooseberry. It seems to be distinct from the arboreous species, and is called by the Brazilians Cajú rasteiro. Although the hilly parts of the country are dry, and have an arid look, the little hollows or vallies which intersect them, have always a small stream of clear and cool water flowing through them, and are generally pretty well wooded. About half a mile from the Aldea of Duro, we overtook an Indian who was returning from the woods, and who conducted us to the house of one of their two captains, of whom we made enquiries about a house to put up in, but he knew of none. After some time, we were permitted to occupy one not yet finished, being open all round, but well roofed; by means of some hides, we, however, contrived to render it somewhat comfortable. As I found it necessary to remain here for several days, I was well pleased to have the use even of this habitation, as it was not safe to trust ourselves in the open air, now that the rains were setting in.

The mission of Duro is situated on the Serra of the same name, upon a low flat hill, round the western base of which, flows a small stream, called the Riácho de Sucuriú, which at all seasons, supplies the inhabitants with abundance of excellent water. The Aldea itself contains about twenty houses, all of which are of the most miserable description; the greater part of them are entirely made of a frame-work of poles covered over with palm-leaves, and many of them are so much decayed from the

united effects of time and weather, that they no longer form a barrier against either wind or rain; others, which are built of wickerwork and clay, are scarcely in a better condition. They are so arranged as to form an irregular square, but two of the sides still remain nearly open; on the west side, there is a small church almost in ruins, with a beautiful large Genipapo tree in front. The mission contains in all twelve square leagues of country, being the grant made to it at its original formation by the Jesuits, and over this space, there are scattered twenty or thirty other houses. The entire population, at the time of my visit, amounted to about 250 souls; although the greater part of them are of pure Indian breed, some of them have mixed with the blacks, who from time to time, have taken up their residence among them, many of these have been run-away slaves. It is very easy, however, to recognize the pure Indian, by his reddish colour, long straight hair, high cheek bones, and the peculiar obliquity of his eyes. Notwithstanding that the present race has been brought up in a comparative state of civilization, they still retain many of the characteristics of the savage state. A few of the more respectable of them dress in the same manner as the Brazilians of the Sertão, viz, in a short pair of cotton drawers, with a shirt of the same stuff hanging loose over them; others make use of the drawers only, which are generally far from being clean, and are made of a very coarse kind of stuff wrought by the women. The dress of the latter, is also very simple; a few wear a chemise, and petticoat made of printed calico, but by far the greater number have only a petticoat of the same coarse material that the men wear, tied round their middle,

all above which is bare. The girls run about quite naked till they are nine or ten years of age, and the boys till they are from twelve to fourteen. Some of the young girls have very pleasing countenances, which, however they do not long retain, judging from the looks of the older women.

Although both the soil and climate of the mission are well adapted for the cultivation of the various productions of the tropics, the inhabitants are so indolent, that they are generally in a state of starvation; I could procure neither farinha de mandiocca, rice, yams, sweet potatoes, plantains nor bananas, and when we arrived, our stock of beef being quite exhausted, it was with the greatest difficulty I succeeded in purchasing a cow. All the cattle which exist in the mission, amount only to about forty, and these belong to two individuals. They possess altogether only seventeen horses. The principal part of the food of these people is of a vegetable nature, consisting of wild fruits which they obtain from the woods, such as the nuts of different kinds of palms, the fruit of the Piki, Pusá, Mangába, Jatoba, Pitomba, Guava, Araçá, &c. At the season we were among them, the principal fruit they made use of, was a kind of palm nut, about an inch and a half long, which they called Shódó. They first cut the oily fleshy substance, which corresponds with the fibrous portion of the Cocoa-nut, and a large stone which is generally placed at the door, is used for breaking the nut upon, in order to procure the substance within. Numbers of these Indians used to start early in the morning, being roused by a kind of drum, and go to the woods to the westward to collect these nuts, and during the day,

nothing was to be heard in the Aldea, but the breaking of them between the two stones. The little animal food they do eat, is procured by hunting, and this is an occupation which the young men are much fonder of, than working in a plantation. A few days after we arrived, thirteen or fourteen of them set off on a hunting excursion to the other side of the Chapada da Mangabeira, and after an absence of eight days, they returned well loaded with the flesh of deer, and of the large kind of Peccary (Queixado), in a half roasted state, this being the plan they make use of, for preserving it for a few days, having no salt for curing it. On their return to the Aldea, this spoil was divided among their friends; it was all immediately devoured without salt or any kind of vegetable, except a few small capsicums. On the following day, scarcely an Indian was to be seen stirring abroad; like the Boa Constrictor, they were sleeping away the effects of their overdose of food. When our cow was killed, I was fearful we should not be allowed to keep any of it to ourselves; for one came begging the head, another the feet, a third the liver, and so on, with all the internal parts; and when these were exhausted, they even began to ask for pieces of the beef itself.

Till within the last ten years, they had a resident priest among them, but since that period, they have been without any; once a year, they have a few days visit from one residing in the Villa de Natividade thirty leagues distant, where their marriages are celebrated, and their children baptized. There is no school in the Aldea, and the only persons who can read and write, are the two captains, one of whom is a man about forty years of age; the

other, who is called Luiz Francisco Pinto, was then in his seventy-fourth year, and from him I obtained nearly all my information regarding the mission. His wife, who was nearly as old as himself, was confined to bed from dropsy; I visited her frequently during our stay, prescribing such medicines as I thought would be of service to her; but what she most enjoyed, was a small basin of tea, which I sent her morning and evening. Part of the wall of the apartment in which she was lying, had fallen in, but an attempt had been made to keep out the wind and rain, by placing a few palm leaves in the aperture. All the inhabitants speak Portuguese, but many of them still keep up the language of their forefathers.

By the old captain I was informed that the mission was established in the year 1730, by a Lieut. Colonel Wencisläo Gomez, who came up with troops from Pernambuco, and conquered the Coroá nation of Indians, being that from which the present race is descended; at that time they formed three Aldeas, and amounted in all to about 1,000 individuals. These three Aldeas were united to form the present one, Duro, which place is called in their own language Ropechedy, signifying beautiful situation, a title which it well merits. Here also I found that the inhabitants lived in constant fear of the Cherente Indians, who inhabit the woods on the banks of the Rio Tocantins to the North-West of Duro. These Indians have made several attacks on the mission, but the occasion on which they committed the greatest havock, was in the year 1789, when a body of them amounting to upwards of two hundred, surrounded the Aldea one morning about ten o'clock, and before evening, had burned all the houses

in the outskirts of the Aldea, and killed about forty persons, including men, women and children, They also carried away four children, two of whom were nephews of the old captain. The inhabitants of the Aldea kept up a constant fire upon the Cherentes, but they could not tell how many of them were killed, as they took all their dead with them when they left.

On several nights, during our stay at the Mission, fires were seen on the Serras at no great distance, and one day, as one of the inhabitants was returning from the woods, he saw an Indian, armed with his bow and arrows, cross the path before him. These circumstances caused the inhabitants to dread another attack, and they were but poorly prepared to meet it. Formerly they used to have a supply of arms and ammunition sent to them every year by the government, but for many years past, these had not been furnished to them, and the old ones were nearly worn out. In cases of necessity, the government can call upon the captains to take the field with their men, and each can raise about forty, able to carry arms. A few of these Indians have guns of their own, which they use in hunting, and their powder is a coarse kind, manufactured by themselves. Some of the shopkeepers in the towns to the south-west, every year go down by the Rio Tocántins to Pará, to sell hides, and purchase European goods; very frequently some of the young men belonging to Duro hire themselves to work the canoes, and with the money which they receive for their services, purchase at Pará, axes and other iron tools; a party of them returned from one of these trips during our visit.

During the fortnight we remained in the Aldea do Duro, I was principally occupied in drying the immense collection of specimens obtained in the latter part of the journey across the Geräes, and the Chapada da Mangabeira, and in packing up all those which had been procured between Santa Rosa and Duro. I also made many excursions in the neighbourhood of the Aldea, and notwithstanding it was then the end of the dry season, I found it an excellent field for my researches. The sandy marshes yielded me many curious *Eriocaulons*, and beautiful *Melastomaceæ*; while the upland Campos produced several species of *Diplusodon*, many *Compositæ*, *Labiatæ*, &c.; but the most common, as well as the most beautiful of the productions of the Campos, were a small *Bignonia* growing in tufts, and scarcely a foot high, bearing numerous large lemon-coloured trumpet-shaped flowers, an *Ipomæa* similar in habit, and about the same size, producing large violet-coloured blossoms, (*Ipomæa hirsutissima*, Gardn.) and two erect kinds of *Echites**; in dry rocky places *Amaryllis Solandræflora*, Lindl., was very common, producing abundantly its large yellow flowers.

We left Duro on the thirteenth of October, and slept at the house of one of the Indians, about two leagues distant from the Aldea: the owner of it, hearing on what day I was to leave, arrived the night before, and begged of me to call at his house, which was but a little way off the road, to see his wife who had been blind for some years, and was then suffering from Ophthalmia. I, of course, could not refuse his request, and the poor fellow tried to make us as comfortable as his miserable residence

* *Echites virescens*, St. Hil., *Dipladenia Gardneriana*, Alph. DC.

would allow. This place was called Cachoeira, from a small water-fall near it; the high undulating hills which surrounded the valley in which the house stood, gave it a very picturesque appearance. There were two other houses, at a short distance from that in which we slept, and although they are surrounded by the finest possible grounds for plantations, the three families have but one small spot planted with mandiocca, which seemed to be the only article they cultivate. Although there were abundant pastures in the neighbourhood, not one of them possessed a single cow, and their excuse for not having one, was the trouble it would give them to make a fence round their plantation; rather than do any manual labour of that kind, they prefer lounging about the house in a state of idleness, or going out in the woods with their gun and axe, in search of game and wild honey. Our farinha being nearly exhausted, I enquired whether any was to be had at this place, but they had none, nor would they have a supply for a month to come, as the mandiocca was not yet ripe; fortunately a young man passed in the evening, with a very small quantity which he at first refused to sell, as he was taking it to a neighbour, in return for some he had borrowed; he consented, however, to let me have half of it, on condition of receiving dried beef in exchange, which, as we had then plenty, I agreed to.

On the journey from Duro to this place, we traversed a beautiful country of hill and dale, much of it being thinly wooded; some of the more open upland fields, owing to the recent rains, were covered with new grass about a foot high, on which no animals fed, excepting a few wild deer; it is a general custom among the cattle farmers, to

burn the pastures at the end of the dry season, in order that the new grass may spring up rapidly on the setting in of the rains; this is also done by the inhabitants of the mission, but with the view to keep their hunting grounds more open, and encourage the visits of deer. It seems probable, that at no very distant period, the whole of this district, and much of the country that lies to the east and north-west, will be converted into large cattle farms, as it is well calculated for the rearing of cattle, owing to the mildness of the climate, and the abundance of grass and water which exists here all the year round.

The rain prevented our leaving Cachoeira on the following day till two o'clock in the afternoon, when after a journey of two leagues, we arrived at the house of the Juiz de Paz of Duro; on account of the bad state of the roads it was dusk before we accomplished this distance. The first league and a half of our journey was over a hilly rocky country, when we began to descend the Serra do Duro, and shortly afterwards, entered upon a flat rather thickly wooded tract. It is at the foot of the Serra that the mission of Duro terminates, and about half a mile from it stands the house in which the Juiz de Paz resided; it was exceedingly small, and as the outer room, that generally given to travellers, would not conveniently hold us, he told me we should find much better accommodation at the house of a relation of his, who lived about a gun-shot distant, and he kindly accompanied us thither. On reaching it, we found half a dozen Indians, sitting round a fire under a veranda in front of the house, and superintending the cooking of their supper in a large pot. While we were arranging our trunks against the wall, the

master of the house begged of us to wait till the men had taken out their beds, when each came and carried his away, which however consisted of nothing more than half a cows hide; they sleep here as in the Aldea, stretching the hide in a corner, on which they lie without taking off their clothes; I saw no one make use of a hammock.

A journey of three leagues from the residence of the Juiz de Paz, through a flat thinly wooded country, almost destitute of herbaceous vegetation, (no rains having as yet fallen in this quarter), brought us to a Fazenda, situated on the banks of the Rio de Manoel Alvez, a large stream, which takes it rise in the Serra do Duro, to the north of the Aldea, and falls into the Rio Tocantins. At this Fazenda we were informed, that as the river had risen considerably, it would be impossible for our horses to cross with their loads; and the canoe used for ferrying over passengers and luggage, had been carried away by the floods of the previous season, circumstances which rendered it necessary to have every thing transported across the river on mens' heads. At the Fazenda I engaged a negro and a mulatto, to assist my own men in this operation; the ferry was about a mile further down, here the river is about forty yards broad, and the current very strong, in consequence of a rapid which exists a little further below. When the two men, who both were tall and strong, entered with the first loads, it was with difficulty they could keep their feet, as the water, during the greater part of the way, took them up to the shoulders; the recompense they asked, half a dollar each, was, however, very dearly earned, as they had each to cross the river backwards and forwards about twelve times, which occupied

more than two hours. Mr. Walker and I attempted to cross a little above the ferry by swimming, but the force of the current swept us both over the rapids; Mr. Walker being carried with great force against some rocks, and it was with no small dificulty, that he reached the opposite side below the rapid, in a state of great exhaustion; I was more fortunate, being carried down at a place clear of rocks, where I soon regained the same bank of the river I had just left. I returned to the ferry, where I succeeded in crossing, being assisted by one of the men, for I was too low in stature to be able to bear up against the current alone. After this delay we resumed our journey, with the intention of halting during the night at a Fazenda about a league further, but, finding we had still ample time, we pushed on to a village called Almas, about two leagues to the westward, which we reached about sunset. The country we passed after crossing the river, was nearly flat, and thinly wooded, but not so much scorched up as that we traversed in the morning.

The village of Almas, is situated in a hollow, and consists of a few irregular streets, the houses of which are low and of mean appearance, being built of large unburned bricks, made of clay mixed with chopped grass and dried in the sun. The number of its inhabitants amounts to about 800, by far the greater part of whom are blacks and mulattos, and intermixtures between these and Indians. The Juiz de Paz was a creole negro, who could neither read nor write; he was the principal shop-keeper in the village, and annually made a journey to Bahia to purchase goods. The village contains a church, which is in about as ruined a condition as that of Duro, and, in like man-

ner has no resident Priest. Although the neighbourhood presents abundance of excellent ground for plantations, not one was here to be seen. Upon our arrival I fully expected to be able to purchase some farinha, but none was to be had; it was indeed only as a very great favour that a person who came to consult me professionally, sold me a little rice. Every one was complaining of the scarcity of provisions, and the want of money, but not a word was said about the indolence and idleness, which no doubt was the cause of the famine that now existed among them. In consequence of almost incessant rains, we were obliged to remain in this village four days.

Our first stage from Almas was to a Fazenda, called Galheiro Morto, said to be only two leagues farther, but I have no doubt its real distance was nearly four, judging from the time we took to perform the journey. The leagues in this part of the country have never been measured, and as the land was originally bought by the league, it was the interest of the purchaser to take as large a portion as he could obtain; in the province of Piauhy, we found the leagues much longer than those of Ceará, but those of Goyaz even exceeded them. This difference is so manifest, that they are designated as the short one (legoa pequena), and the long one (legoa grande); the shorter league I always found to be quite long enough, and whenever the long one was to be travelled over, I usually calculated the time necessary for accomplishing two short ones and, indeed I seldom found it required less. We halted at this place till the afternoon, when another journey of three leagues brought us to a little hamlet, consisting of about half a dozen houses,

called Morhinos. The owner of the house where we put up for the night, returned from the woods shortly after our arrival, with a considerable quantity of wild honey, some of which he kindly gave us, and we found it to be excellent; it was the product of one of the smaller bees which are so numerous in this part of Brazil. This was the season in which the people go to the woods, in search of honey; it is so generally used, that after leaving Duro, a portion was presented to us at almost every house where we stopped. These bees mostly belong to the genus *Melipona*, Illig., and I collected a great many, which with some other zoological specimens, were afterwards lost in crossing a river. A list of them with their native names and a few observations, may not be uninteresting.

1. *Jatahy.*—This is a very minute yellowish coloured species, being scarcely two lines long. The honey, which is excellent, very much resembles that of the common hive-bee of Europe.
2. *Mulher branco.*—About the same size as the *Jatahy*, but of a whitish colour; the honey is likewise good, but a little acid.
3. *Tubí.*—A little black bee, smaller than a common house-fly; the honey is good, but has a peculiar and bitter flavour.
4. *Manoel d'abreu.*—About the size of the *Tubí*, but of a yellowish colour; its honey is good.
5. *Atakira.*—Black, and nearly of the same size as the *Tubí*, the principal distinction between them consisting in the kind of entrance to their hives; the *Tubí* makes it of wax, the *Atakira* of clay; its honey is very good.

6. *Oaritĭ.*—Of a blackish colour, and about the same size as the *Tubí*; its honey is rather sour, and not good.
7. *Tataíra.*—About the size of the *Tubí*, but with a yellow body, and a black head; its honey is excellent.
8. *Mumbúco.*—Black, and larger than the *Tubí*; the honey after being kept about an hour becomes as sour as lemon juice.
9. *Bejuí.*—Very like the *Tubí*, but smaller; its honey is excellent.
10. *Tiubá.*—Of the size of a large house-fly, and of a greyish black colour; its honey is excellent.
11. *Borá.*—About the size of a house-fly, and of a yellowish colour, its honey is acid.
12. *Urussú.*—About the size of a large humble bee; the head is black and the body yellowish, it produces good honey.
13. *Urussú preto.*—Entirely black, and upwards of one inch in length; it likewise produces good honey.
14. *Caniára.*—Black, and about the same size as the *Urussú preto*; its honey is too bitter to be eatable; it is said to be a great thief of the honey of other bees.
15. *Chupé.*—About the size of the *Tiubá*, and of a black colour; it makes its hive of clay, on the branches of trees, and is often of a very large size; its honey is good.
16. *Urapuá.*—Very like the *Chupé*, but it always builds its hive rounder, flatter, and smaller.
17. *Enchí.*—This is a kind of wasp, about the size of a

house-fly; its head is black, and the body yellow; it builds its hive in the branches of trees; this is of a papery tissue, of about three feet in circumference: its honey is good.

18. *Enchú pequeno.*—Very similar to the last, but it always makes a smaller hive; it also produces good honey.

The first eleven of these honey-bees construct their cells in the hollow trunks of trees, and the others, either in similar situations or beneath the ground; it is only the three last kinds, which sting, all the others being harmless. The only attempt I ever saw to domesticate any of these bees, was by a Cornish Miner, in the Gold District, who cut off those portions of the trunks of the trees which contained the nests, and hung them up under the eaves of his house; they seemed to thrive very well, but whenever the honey was wanted, it was necessary to destroy the bees. Both the Indians and the other inhabitants of the country, are very expert in tracing these insects to the trees in which they hive; they generally mix the honey, which is very fluid, with farinha before they eat it, and of the wax, they make a coarse kind of taper about a yard long, which serves in lieu of candles, and which the country people bring to the villages for sale. We found these very convenient, and always carried a sufficient stock with us; not unfrequently we were obliged to manufacture them ourselves, from the wax obtained by my own men; a coarse soft kind of cotton yarn for wicks, was always to be purchased at the different Fazendas and villages through which we passed.

From Morhinos, we went on to the Fazenda of Nossa

Senhora d'Amparo, the distance being about three leagues. It was my intention to have proceeded two leagues further, to a Fazenda called Santa Cruz, on the banks of the Rio do Peixe, there being a canoe there for crossing it; but having enquired about the state of the river, we were informed that it was then low, and might be forded at a place farther up, without taking off the loads, and, moreover, save a circuit of nearly two leagues. We had yet about a league to go before we reached this ferry, where I found the river much smaller than that of Manoel Alvez, and shallow enough to be passed without difficulty; but, notwithstanding this, one of the loads of dried plants met with a sad misfortune, the horse that bore it slipped, and fell down, just as he was emerging from the bank, when one of the boxes dropped into the river, and before it could be extracted was filled with water; it is only a botanist who can imagine my feelings on this occasion, when I saw upwards of 2,000 specimens, that had cost me so much labour to procure, completely drenched, and apparently ruined for ever. My first care was to unpack them, and put them into dry paper, but so many specimens were laid on every sheet, that this process had but little effect in dissipating the moisture; I contented myself, however, with the hope of being able next day to unpack them, and spread them out in the sun. After the box was dried, and the plants again deposited in it, the package was, for greater security, placed upon a stronger horse; we had not, however, proceeded above half a league, when in crossing a small rivulet, I had again the mortification to see the same box, as well as another that had previously escaped this disaster, both plunged below

the water. The unlucky animal that carried them was leading the way, when instead of entering at the right fording-place, he stumbled into a deep hole, with a muddy bottom, and in struggling to extricate himself, flung off both the packages. If I felt much chagrined on the former occasion, it may be imagined what my distress was, when I saw the hard labour of many weeks, the produce of a district hitherto unexplored by any botanist, thus apparently consigned to ruin; all that then could be done, was to drain the water out of the boxes, and resume our journey. It happened most fortunately that towards evening, we reached a Fazenda, where the principal article manufactured, was farinha de mandiocca; and as it rained heavily all the next day, I was glad to obtain permission to make use of two large stoves, on which we dried, sheet by sheet, all the specimens that had been soaked; it was, however, the most fatiguing day's work I ever encountered, for both Mr. Walker and myself were incessantly occupied over the heated stoves, from six o'clock in the morning till after midnight. In consequence of this prompt attention, the plants did not suffer as much as I anticipated.

We remained two days at this Fazenda, called Mato Virgem, having to wait one day longer than I intended, owing to our want of farinha; the day after our arrival they commenced the manufacture of a quantity, which could not be got ready until the evening before we left. The place in which it was prepared, was the apartment where we were allowed to put up, the persons engaged in it, being the mistress of the house, who was a young mulatta, and eight slaves, four men, and four women; I was

astonished to find all of them, except one man, and one woman, affected with goitre; the swelling on the neck of one of the women, was much larger than her head. They assured me it was a very general complaint in this part of the province of Goyaz, particularly in the Villas of Natividade and Arrayas; in the Aldea of Duro, I saw only one woman affected by it, and another in the Arraial of Almas. One of the slaves was an old man upwards of one hundred years of age, and quite blind, but he was, notwithstanding, occupied all day in sifting farinha; his only dress consisted of a small dirty rag rolled round his middle; that of the others was but little better, indeed, in no part of Brazil did I meet with slaves so wretchedly attired as at this place. It was surprising to me that the mistress was not ashamed to see them in such a state; but I have no doubt, the fault was with the owner of the Fazenda, who, judging from his appearance, seemed to be an old miser.

When we left Mato Virgem it was our intention to reach a little hamlet, called João Lopez, said to be three long leagues distant. We were told that we should have no difficulty in getting there, as there was a straight road to it; but we had scarcely travelled a league and a half when we came to a place where there were two equally beaten paths, and not knowing which to take, we chose that leading to the right, and continuing onwards all day, through a flat thinly-wooded country, without seeing either man or house, we arrived at a Fazenda, a little before sun down, where we were told, what I already suspected, that we had taken the wrong road; but it was of little consequence, as it led also to the Villa de Nativi-

dade, the place we finally intended to reach. This Fazenda, called Sociedade, belongs to Senhor Manoel José Alves Leite, a young Portuguese, who was then Juiz de Paz of the Arraial da Chapada, a village about a league distant. On our arrival, we were very kindly treated by him; a fowl was immediately killed, and an excellent supper prepared, to which we did ample justice, after our long day's journey. The Portuguese who settle in the country, are said, by the Brazilians, to be of a mean and grasping disposition, and deficient in the sentiment of benevolence; this may be the case with many among the great number of the uneducated, who emigrate from Portugal to Brazil, where there is not much inducement to the improvement of their character, but among them there are many young men, who have received some education, and who by their good behaviour, and closer attention to business than the proud and indolent Brazilians, sooner acquire means of independence, which causes them to become the object both of their envy and dislike. I had little opportunity of associating with the Portuguese on the coast, but in the interior, I have met with many worthy men of that nation, who have shown me the greatest kindness, when this has been refused by a Brazilian. Ever since the independence of Brazil, they have been very greatly persecuted, and whenever any political disturbance takes place, as a necessary consequence, numbers of Portuguese are murdered, and robbed of all they possess: there exists no fellow-feeling between the two nations. As soon as our host became aware of my intention to remain a month or two at Natividade, in

order to give rest to my horses, he most kindly urged me to send them to his Fazenda, where he would take charge of them till our departure; such, indeed, was the civility we experienced, that I had no reason to regret having taken the wrong road.

Early on the following morning, the 25th of October, we left Sociedade, and after a journey of two long leagues, reached the Villa de Natividade. The country between these two places, is flat and thinly-wooded, but on the east side of the road, near the Villa, there is an extensive Serra, about 2,000 feet high, which stretches from north to south. The road passes near the base of this Serra for about half a league, and I was astonished to see the soil, which is of a gravelly nature, dug up into deep trenches, and at intervals, the ruins of what appeared once to have been houses; these trenches, I was informed, were old gold-workings, which had been abandoned for a long time, on account of the gold being exhausted. The gold-workings seem to have been carried to a considerable extent, for the entire soil, for about half a league in length, and more than a quarter of a mile in breadth, had evidently been completely turned over, to some depth, and the whole appeared to have undergone the process of washing; I afterwards found that most of the country in the vicinity of the Villa, had been explored in the same manner. On our arrival, we had no difficulty in finding an empty house, for our accommodation, and shortly afterwards, the rains set in very heavily, on which account we were detained here upwards of three months. This, however, I did not regret, after our long journey of

considerably more than a thousand miles, reckoned from the time we left Oeiras, from the effects of which the horses had become much exhausted.

I must not omit to mention, that on our journey from Duro to Natividade, we met with great abundance of a delicious wild fruit, a kind of Mangaba (*Hancornia pubescens, var. Gardneri*, Alph. D.C.) different from the one that grows so abundantly in the provinces of Ceará and Pernambuco; the fruit is nearly twice its size, and even more delicious. We first met with it on the Serra do Duro, where it is called Mangaba do morro, but it is also abundant on the Chapadas, on the plain below, and like that of the other species, this is only good to eat when ripe enough to fall from the tree.

CHAPTER X.

NATIVIDADE TO ARRAYAS.

The Town of Natividade described—Its Population—Dress and Manners of the People—Its Climate—Diseases—Goitre extremely prevalent—Excursion to the neighbouring lofty Mountain Range—Its Geology and Vegetation—Visits the Arraial da Chapada—Leaves Natividade—Passes San Bento, and arrives at the Arraial de Conceiçao—Its Population—Very subject to Goitre—Probable cause of this Complaint—Reaches Barra, and crosses the Rio de Palma—Arrives at Santa Brida—Stays at Sapè—Account of the Animal and Vegetable Productions of the Neighbourhood—Reaches the Villa de Arrayas—the Town described—Geological Features of the surrounding Country—Its Climate and Productions—Alarm of the Inhabitants—Muster of the National Guard—Preparation for departure.

The Villa de Natividade is situated near the western base of the southern extremity of the Serra already mentioned, which bears the same name, and like most of the towns in the interior is very irregularly built. The population amounts to about 2,000 souls, consisting of the same mixed races we had so frequently met with before. It contains four churches, which although now very old, are not yet quite finished, nor is it at all likely that they ever will be completed. There is also a jail, but it is built of unburned bricks, through which the prisoners generally contrive to escape, so that it can scarcely be called a prison. Most of the houses are constructed of

material. The inhabitants are lazy and indolent in the extreme, and consequently there is always a great scarcity of the common necessaries of life among them; notwithstanding that much of the country in the neighbourhood of the Villa is well suited for plantations of mandiocca &c., still very few are to be seen; and although there are many large cattle farms, at only a few leagues distance, it is not above once a month, that fresh beef can be purchased; but this is not much to be wondered at, as the mass of the inhabitants, from their indolent habits, have not the means of buying it, or any other useful article. On enquiry of one of the most respectable persons in the place, how these people contrived to live, he told me that the few who were industrious, had to support the others, for they generally stole from their plantations, as much as served to sustain their miserable existence. During our stay, we were obliged to live almost entirely on farinha and dried salt beef, neither rice, plantains, nor yams being obtainable. Occasionally I was able to purchase a kind of coarse biscuit, made of Indian corn flour, and once or twice I had a present sent me of a few small loaves, made from wheat grown on high lands, near the town of Cavalcante, a long way to the south. I never saw wheat cultivated in any of those places I visited, and this was the only time I ever tasted bread made from that grain grown within the Tropics.

Although the dress of the men is here much the same as in other northern parts of Brazil, that of the women differs greatly, for when dressed either for attending church, joining in processions, or visiting their friends, in place of the large white cotton shawl, which the women of Ceará

throw over their heads, or the small white handkerchief used in Piauhy for the same purpose, I was rather surprised to find that here, they all wore cloaks, either made of Scotch tartan, or blue cloth, very similar to those worn by the factory girls of Glasgow in the winter season. Here it is a universal custom for the women to smoke, and the pipe, which has a wooden tube about three feet long, is seldom out of their mouth from morning till night. They work little, but eat and sleep a great deal; the lower classes of females are also much addicted to drinking the rum of the country (Cachaça). The only prisoner confined in the jail, while I was there, was a woman, who a few years before was condemned to twenty years imprisonment, for causing her own son to kill his father. The son who was condemned to perpetual imprisonment and hard labour, broke through the walls of the prison, shortly after his sentence, and effected his escape.

When we arrived, there were three priests in the Villa, one of whom died during our stay. These like most others I met with, instead of being examples of morality to the people, were immoral to an extent almost past belief. The one who died, was an old man upwards of seventy-four years of age; he was a native of Santos in the province of San Paulo, and a cousin of the celebrated José Bonifacio de Andrade. Although a man of a very humane and benevolent disposition, and well educated, he left behind him a family of half a dozen children by his own slaves, most of whom, with their mothers, were left in bondage, and were afterwards sold with his other effects for the payment of his debts. The Vigario Geral was a half cast, upwards of forty years of age, who had only been ordained

a few years before; up to that time he was and still continues to be, the largest cattle farmer in the district. Having acquired as much Latin from the old priest, as would enable him to mumble over the service of the church, but without the least knowledge of theology, he went to the city of Goyaz, to purchase his ordination from the bishop; a short time afterwards he obtained by another purchase the vicar generalship of the district. About a month after my arrival in the Villa, I was sent for to attend a young slave belonging to him, a fine girl about sixteen years of age, who died of puerperal fever, a few days after giving birth to a child, of which he was the father; by the inhabitants, this man was as much detested, as the old priest had been loved and esteemed.

Both the soil and the climate of this neighbourhood are far superior to those of Piauhy and Ceará; the rains generally set in about the beginning of October, and continue more or less till April. During the whole of the month of December, and part of January, it rained almost incessantly every day, rendering it quite impossible to stir out; but in the latter part of January and the beginning of February the weather was very fine, with the exception of the afternoons, when there was usually a heavy thunder storm. The thunder-storms, and the rain generally came from the north, north-east, and east, originating probably on the Serras which exist at a considerable distance in those directions. Indian corn and mandiocca are the principal articles cultivated here; but many of the Fazendeiros also find it profitable to plant cane, not so much for the manufacture of sugar, as of rum, which meets a ready sale. The only fruit trees that are cultivated are

orange and lime, and in a few instances the jaca, and tamarind.

The principal diseases of this district are intermittent and malignant fevers, especially at the beginning and towards the end of the rainy season. Ophthalmia and its consequences, as well as Syphilis and its effects, are also very common, and yearly produce many miserable objects. Nearly the whole of the inhabitants are affected with goitre, and children are frequently born with it, even strangers who come to reside in the Villa and neighbourhood, are sure to become affected with it in the course of a few years. Some ascribe it to the use of the sea salt brought from Pará, the people having previously been accustomed to the use of that they obtain from the soil in the neighbourhood, which is impregnated with salt; others say that it is caused by the waters from the Serra, which in the dry season particularly, are a little saline. Whatever the cause may be, all seemed to agree both here, and at Almas, that it is only within the last twenty years, that it has become so prevalent among them: I found it quite as frequent at Conceição and Arrayas, two towns further to the south, at which places the waters are also saline, especially those flowing from the limestone mountains. All the places where I have seen it prevail, lie along the eastern base of the Serra Geral, a broad mountain chain, which divides the province of Goyaz from those of Pernambuco, and Minas Geraes; burnt sponge is the only remedy they employ against it. They have, however, recourse to another method, in which they put great faith; this is a small piece of cord, taken to a church, and cut exactly the length of the image of the crucifixion, which

they wear round their necks. I made enquiries of several who wore this kind of charm, whether they imagined it produced any effect on the swelling, but, as was to be expected, they all confessed that it not only failed in curing it, but in no way prevented it from increasing in size.

I had now reached the most northerly point of the Brazilian Empire, that had previously been visited by any naturalist, for neither Pohl nor Burchell had extended their excursions beyond Natividade. It is true that Spix and Martius also travelled in the north of Brazil, but their route was in a very different direction. As I was here informed that these travellers had not ascended the neighbouring lofty Serra, I was resolved to do so, for the double purpose of making botanical collections, and of examining its geological structure. On this journey I was accompanied by Mr. Walker, a black shoe-maker who acted as a guide, and one of my own men. Following the banks of a small stream which comes from the Serra, and which passing near the north end of the Villa, yields it a constant supply of clear and cool water, we reached the foot of the Serra, and shortly afterwards, by a gradual ascent arrived on the top of a low branch, where we found a broad shallow valley, the soil of which had been completely turned over in search of gold, and near the centre of it, we came upon the ruins of what we were told had been the original site of the Villa; it was founded by those who first ventured into this distant region, in search of gold, and was abandoned about sixty or seventy years ago, when this metal became scarce, and when cattle farms were found to be more productive than mines. Near the top of this valley there is a small

artificial lake, which must have been formed at a great expense, and from it the water was led in small streams to the places where the washings were going on. The soil in which the gold was found, is a ferruginous gravel, formed from the disintegration of the primitive rocks of which the Serra is composed.

Leaving the valley of the Gold Mines, which is above a mile in length, and beginning to ascend the higher part of the Serra, which is very thinly wooded with small trees, and covered with abundance of tree-lilies (*Vellozia*), as well as several kinds of coarse grass, we arrived at a place near the summit, which was rocky, steep, and of difficult ascent. It was some time before we could find a proper path, and in doing so, Mr. Walker, who was the first to climb up, met with an accident which nearly proved fatal to him; when near the top, part of a rock by which he laid hold, gave way, and he was precipitated from a height of about sixteen or eighteen feet, with great violence, and rolled over some large stones to within a few feet of a deep precipice; it was a most fortunate circumstance for him that he did not go over it, or he would have been dashed to pieces. Although considerably bruised, he was again the first to lead the way, reaching the top with safety, where, with more or less difficulty we followed him. On attaining this point, we thought we had gained the highest part of the Serra, but about half a mile to the north we saw another point considerably higher, to which we now directed our steps. During the ascent the sun was very powerful, but at this elevation, we found a deliciously cool breeze blowing from the east, which was very refreshing. We all suffered

from thirst, and fortunately found, at the base of the highest peak, a little pool of clear cool water, by the side of which we took some refreshment that we had brought with us. From the summit we had a beautiful prospect in all directions; to the eastward and north, the view was bounded by several chains of low Serras, but to the westward and south, the country appeared one vast plain, which was lost in the horizon. The top was covered with large blocks of granite, among which grew a few stunted trees and shrubs.

I found the western side of the Serra to be bounded by a thick bed of very compact greyish coloured limestone, which beyond the northern point of the Serra, for some leagues, forms large isolated hills, covered with wood. The central part of the chain is granite, between which, and the limestone formation, the rocks are schistose. My botanical harvest was a very rich one, so much so, that I was induced on two subsequent occasions, to ascend the mountain again. I collected, in particular, many curious and beautiful little ferns, all new species, and several beautiful *Vellozias*; these plants are peculiar to Brazil, and as I have so often spoken of them, I shall here describe their appearance: they belong to the *Endogenous* or *Monocotyledonous* division of the Vegetable Kingdom, and were named in honour of Dr. Joaquim Vellozo de Miranda, a Jesuit, who was a native of the province of Minas Geräes, and who devoted much of his leisure time to the study of the botany of his country. They are most commonly found on the mountains of the interior, but principally in the Gold and Diamond districts, growing in open grassy places, and often covering large

tracts; they vary in height from a few inches to twelve feet, their stems are very dry and fibrous, and seem to be made up of a great mass of long slender roots loosely hung together; and not unfrequently they contain a resinous matter, which causes them to be sought after in the woodless regions of the Diamond district for fuel. Sometimes these stems are not less than a foot in diameter, they are very much branched, and are entirely leafless, except the last divisions of the branches, which are clothed with long, narrow, aloe-like leaves, not however, fleshy; from the centre of these spring the flowers, which are generally solitary, although some of the smaller species have as many as six arising from the end of each branch. In the large kinds, the flowers are about six inches long, either of a pure white, or more frequently of a beautiful purple colour; in shape, they are not unlike the large white lily of our gardens, and hence their name of tree-lilies. These plants are called by the Brazilians, Canela d'Emú (literally Emu shanks) from their bare stems resembling the legs of that bird. These beautiful plants were first introduced into the hothouses of England, from seeds sent home by me, and as they are of very slow growth, and apparently difficult of cultivation, it may reasonably be expected they will be a long time, before they can exhibit the beauty of their wild progenitors.

Besides many shorter excursions which I made in the neighbourhood of Natividade, I went several times to the Arraial da Chapada, a village about two leagues to the N.W.; it is about half the size of Natividade, and is situated on one of those low, flat table-lands called Chapadas, and hence its name. The country round it, as

about Natividade, has all been turned over in search of gold, but those who formerly employed their slaves on this labour, now find it more to their profit to employ them on plantations; there are still a few old free blacks who get a scanty livelihood by washing the soil. On my visits to this place I was always very hospitably entertained by Captain Baptista, an old Portuguese, who has been settled there for many years, and who is father-in-law to the proprietor of Sociedade. He spoke much of Pohl and Burchell, both of whom remained some time in the Arraial, and with whom he seemed to have been intimate. My visits to this place afforded large additions to my collections, the limestone hills near Sociedade in particular, being very rich in plants. During my stay in the Villa de Natividade, I received much kindness from Senhor Zacaria Antonio do Santo, the Juiz dos Orfãos. I had many visits also from a person who lived at a little distance from the Villa, and who at one time had been Juiz de Paz; he was a very good-natured and simple minded man, as the following anecdote will show. The first time he called on me, he said he wished to speak with me in private; he began by telling me that he had heard the English had the power of divining where hidden gold was to be discovered, and that as much gold was to be found in the Serra, if I would point out where a rich mine existed, he would undertake to work it, and share the profits with me. In almost the same breath he informed me, that a few years ago a Portuguese died in the neighbourhood, who was always considered to be very rich, but that on his decease no money was to be found; now, he said, he fully believed that it was all buried, somewhere

near his house, which was now in ruins, and that if I would accompany him there, and discover it, we could, without any one knowing it, share it between us. The poor old fellow seemed sadly disappointed when I told him that I had never made such a branch of knowledge my study.

One dark night, about the beginning of December, while passing along the streets of the Villa de Natividade, I observed some boys amusing themselves with some luminous object, which I at first supposed to be a kind of large fire-fly; but on making enquiry I found it to be a beautiful phosphorescent fungus, belonging to the genus *Agaricus*, and was told that it grew abundantly in the neighbourhood, on the decaying leaves of a dwarf palm. Next day I obtained a great many specimens, and found them to vary from one to two and a half inches across. The whole plant gives out at night a bright phosphorescent light, of a pale greenish hue, similar to that emitted by the larger fire-flies, or by those curious soft-bodied marine animals, the *Pyrosomæ*; from this circumstance, and from growing on a palm, it is called by the inhabitants "Flor do Coco;" the light given out by a few of these fungi, in a dark room, was sufficient to read by. It proved to be quite a new species, and since my return from Brazil, has been described by the Rev. Mr. Berkeley under the name of *Agaricus Gardneri*, from preserved specimens which I brought home. I had already named it *A. phosphorescens*, not being aware at the time I discovered it, that any other species of the same genus exhibited a similar phenomenon; such, however, is the case in the *Agaricus olearius* of De Candolle; and Mr. Drummond of the Swan River Colony, in Aus-

tralia, has given an account of a very large phosporescent species, occasionally found there.*

On the 10th of February 1840, we left Natividade, with the intention of proceeding to the Villa de Arrayas, a small town about thirty leagues to the S.E.; we had made all our preparations to leave on the second, but had the mortification to find one of our horses missing, which detained us eight days; it proved, in the end, that some one had taken the loan of it, for four days after our departure, it was found near the place whence it had been taken, and was sent after me by my friend the Juiz dos Orfãos. Leaving Natividade, and skirting the base of the Serra in a southerly direction, we arrived at the banks of a small river called the Riacho Salobro, which flows towards the west, and falls into the Manoel Alvez: its waters are very brackish during the dry season. The loads had all to be passed over a rude kind of bridge (pingella) formed of the trunks of two trees, and as both the river and its banks were deep, we had no little difficulty in getting the horses across, which was done by swimming them. We remained for the night at the Fazenda das tres legoas, nearly three leagues from the Villa as its name implies. On the following morning, after a journey of one long league and a half, we again reached the banks of the Rio de Manoel Alvez, at a place where it was both much broader and deeper than where we previously crossed it; here, however, we were fortunate enough to find a canoe. My first care was to have the horses passed to the other side, which was done by two men entering the canoe, and each taking hold of a

* Hooker, *Journal of Bot.* Vol. 1. p. 215.

halter they were swum over, two at a time. Before all our luggage was conveyed to the opposite bank, a heavy thunder-storm passed over us from the N.E., which drenched us completely; in consequence of this I thought it best to proceed at once to the first house, which was only half a league distant, where we remained for the night. The country between the Villa and the river is nearly a flat plain, consisting of large open campos, marshes, and tracts, but thinly wooded with small trees. Several beautiful flowering shrubs, and a few terrestrial *Orchideæ* were collected on this journey.

From this place, a journey of about ten leagues brought us to the Arraial de Conceição, a distance that occupied us two days and a half. On the night of the 12th we slept at a large cattle Fazenda, called San Bento, and a very stormy afternoon prevented us from leaving it. Till within about a league of the Arraial, the country continues flat and open, but afterwards it became hilly, the hills being low and often rocky. So thinly is the country populated in these districts, that between San Bento and the Arraial, a distance of at least twenty miles, we passed only one house. The greater part of this district is only adapted for the rearing of cattle, but there is much also admirably suited for plantations of different kinds.

The Arraial de Conceição contains a population of about one hundred persons; but there are many houses in the village, belonging to Fazendeiros, who only occupy them at the time of the principal church festivals; blacks and mulattos form the greater portion of the residents, and during the four days we remained here, we saw very few white people. This village is situated in a hollow be-

tween two small hills, but the country around in general is level; the houses stand principally in two long streets, and one of the two churches it contains is now in ruins. The water with which the Arraial is supplied, is obtained from a small rivulet, it is very bad and of a brackish taste; it seems to have some connection with the production of goitre, so prevalent along the western side of the Serra Geral, which, as far as I have traced it, is bounded by limestone similar to that which exists at Natividade. The streams which flow over these rocks are all more or less saline, and wherever these waters are drunk by the inhabitants, there goitre is found to exist. Along the eastern side of the Serra, on the contrary, this disease is scarcely to be met with, and there, at least in those parts which I visited, no limestone was to be seen, nor were any of the rivulets impregnated with saline matter.

The soil for nearly a league round the village, has evidently been well turned over, in search of gold, and from all accounts, a considerable quantity was found in former times; the little met with at present scarcely repays the labour of searching for it. The soil in which it is found is of a clayey, gravelly nature, being evidently the debris of primitive rocks, the gold appearing either in very minute particles, or in grains of all sizes, some of which are said to weigh several ounces. Rich veins are also supposed to exist in the solid rock, which consists mostly of quartz, but these they cannot explore to any depth, as they do not possess the means of getting rid of the water which accumulates. I was informed by the Vigario, who perhaps exaggerated the fact, that at a short distance from

the village there exists a mine so rich, that a small bucket of soil yields nearly a quarter of an ounce of gold; he said it was not above twenty feet deep, but in consequence of the influx of a spring, it had been abandoned for a long time. The only method they employed to get rid of the water, was by a number of men stationed at different heights, who handed it to one another in buckets; when I enquired why they did not make use of pumps, he said they had only heard of such things, but had never seen them, the mechanics of the place being so ignorant that they do not know how to construct so simple an instrument! From the Vigario I received a great deal of kindness during my stay; he was a man of very benevolent disposition, and much respected by the people; although advanced in years, he was of a very active temperament, far more so, indeed, than the generality, not only of his class, but of his countrymen. He was the only person in those parts who was a subscriber for a newspaper from Rio de Janeiro, but from the irregularity of the posts, long intervals often elapsed in their delivery. He kindly gave me a letter of introduction to one of the most influential persons in the neighbourhood of the Villa de Arrayas, who was his intimate friend.

Within the last twenty years, two slight earthquakes have been felt both at Natividade and Conceição; the first occurred in the year 1826, and the other in 1834; the movement of the earth was very perceptibly felt in both places, although they were each of short duration. These were the only places in Brazil where I could learn such phenomena had been observed.

We left Conceição on the morning of the 17th of Feb.,

when a journey of four long leagues brought us, late in the afternoon, to the banks of the Rio da Palma. About half a league from the Arraial, the road winds round the end of a somewhat lofty ridge of rocky hills, not far from the foot of which, we passed some small Gold Workings. The slaves employed in this occupation do not give all they find to their masters, for they are obliged to maintain and clothe themselves, and pay to their employers a certain fixed sum of money, somewhere about six shillings per week. Many of them have been fortunate enough to purchase their freedom, but the greater number of them become indolent and dissipated. A short time before our arrival, a slave found a piece of pure gold weighing upwards of ten ounces, which was more than sufficient to procure him his freedom. The fields about here, were gay with a fine terrestrial Orchideous plant, an *Epistephium*, about two feet high, bearing a spike of large rose-coloured flowers. We halted during the middle of the day, at the only house on the road, the Fazenda de Pindobal, and started early again, so as to reach the Rio da Palma in good time to cross it. The country we found to be nearly flat, consisting of large open campos, which were better stocked with cattle than any we had hitherto passed through in this province. When about half way to the river, we unfortunately went off the proper path, and got upon a cattle track, which in those thinly-inhabited countries, often lead the traveller astray, the highway having quite the same appearance; it was some time before we discovered our error, but knowing the direction in which the river ran, we made direct for it, and in less than half an hour were so fortunate as to come upon the right road

again, which now lay through a thin forest, consisting principally of *Qualea parviflora*, Mart. In consequence of the delay thus occasioned, it was nearly sunset before we arrived at the ferry.

We found the river much swollen, although it had not rained here for more than a week, but we concluded that much rain had fallen recently further up the country. Owing to this circumstance, and to the lateness of the hour, we had some difficulty in prevailing on the ferryman to carry us over to the other side. The Rio da Palma is considerably broader than that of Manoel Alvez, and flows with much greater force. In this, as in the former river, the canoe is maintained at the expence of government, but it was here on so small a scale, that only one horse could be taken over at a time; in this tedious manner the transit was repeated no less than twelve times before all could be passed over, which occupied more than three hours. This place is called Fazenda da Barra, and contains several houses on both sides of the river; that to which we were directed to find accommodation, was so small, that as the night promised to be fine, we preferred taking up our quarters under some trees that grew in front of it.

On the following morning, after we had travelled about two leagues and a half, we were obliged to stop in consequence of two of the horses becoming very much fatigued, caused, most probably, by the great exertion of crossing the river the night before. We halted at a place near the foot of the Serra de Santa Brida, where only a few small trees grew, which were barely sufficient to shelter us from a powerful sun. This Serra is a

branch of the same range as that on which the Villa de Arrayas is situated, and runs in a north-west direction to within about two leagues of the Rio da Palma; at its highest part it is not more than a thousand feet above the level of the surrounding country. In the afternoon we again made a short stage of about a league and a half, and encamped for the night under some small trees, by the side of a clear little rivulet that flows from the Serra. On this journey we met with some showers of rain, and when we arrived at the place of our encampment, a heavy thunder-storm came rolling along the Serra towards us from the south-east, which made us regret that we were under the necessity of sleeping in the woods; fortunately, however, as it approached near to us, it turned off suddenly towards the north, after which we had the advantage of a beautiful night. Our route on this journey, was through a large flat open valley, bounded on the north and east by the Serra de Santa Brida, and on the south and east by another range, called the Serra de Buriti. This valley consists of large open campos abounding in tree-lilies, and is but thinly wooded, except on the margins of small streams that flow from the mountains. Next morning we made a journey of two leagues through a similar country, and arrived early in the forenoon at the Fazenda de Santa Brida, which belongs to a person for whom I brought letters from the Vigario of the Arraial de Conceição. He does not, however, reside here, and the only house we found was one belonging to the vaqueiro who has charge of the cattle. As the pasture was good, we remained here till the following day, in order to give the horses a little rest.

We left early in the morning, and at a short distance from the Fazenda, crossed a small river which was well wooded along its banks with large trees, particularly the Jatoba (*Hymenæa*). In this river, as in all those within this province, the electric eel (*Gymnotus electricus*) is very common; they are of all sizes, from a foot to six feet in length, and are frequently caught on the lines which are set for other fishes; they are sometimes eaten, but not generally, although their flesh is said to be very good. Horses as well as men, by coming in contact with them in the water, are not unfrequently thrown down by the shock which they impart; they are called by the inhabitants Treme-treme. In rainy weather, those who fish in these rivers often receive a shock, which is communicated along the moisture upon the rod and line, when one of them happens to seize the hook. I saw one in a state of captivity, about six feet long, which was so tame that it would allow any one to put his hand upon it, and even slide for its whole length through the fingers, but if irritated in the smallest degree, by pinching it a little, however slightly, it instantly communicated a smart shock. A fatiguing journey of upwards of four leagues, under a burning sun, and through a rather open country, brought us to the Fazenda of Sapê, the residence of the owner of the Fazenda of Santa Brida, Lieut. João Gomez Lagoeira. On our arrival, I was informed that he had gone to visit a plantation a little way off, but was expected home immediately. In an hour's time he made his appearance, and on reading the letter I brought from his friend the Vigario, he gave me a most hearty welcome. It was my intention to have proceeded to the Villa de

Arrayas, which is four leagues distant, on the following morning, but this our kind host would not listen to, and it was only after the expiration of five days, that he consented to our departure. In order that we might not reach the Villa short of provisions, he sent to one of his cattle farms for a fat ox, which was killed and dried for our use, and he also obliged me to accept a load of farinha.

The Fazenda of Sapê is situated at the foot of the Serra de Santa Brida, near the entrance of a small valley, which is enclosed on both sides by the surrounding hills; the grounds belonging to it being well watered, and the soil rich, they are well adapted for the cultivation of the sugar cane, of which there are several large plantations. The greater part of the cane is converted into rum, for which there exists a greater demand than for sugar; rice and mandiocca also yield abundant crops. The whole of the property which Lieut. Lagoeira possesses, covers an area of about sixty-four square miles; it is divided into several Fazendas for the rearing of cattle, which amount to about fourteen thousand head, the produce of which are principally sold to drovers, who take them down to Bahia. He was originally a drover, but becoming a great favourite of the former owner of the estate, he obtained his daughter in marriage; and the father dying soon after, the entire management of the Fazenda fell into his hands. Being a man of a mild and benevolent disposition, and having received a good education, he is looked up to and respected by the inhabitants of all the surrounding country. During our residence at this Fazenda, and the several times I visited it during my residence at Arrayas, I made several excursions in its neighbourhood. On

these occasions I was always accompanied by Senhor Lagoeira, who was a keen sportsman; sometimes we went to an upland grassy plain, thinly covered with *Vellozia* and *Diplusodon*, the latter, a beautiful little shrub, bearing a profusion of small rose-coloured flowers. On these dry plains are found plenty of a kind of quail, called Perdiz, which is a species of the genus *Tinamus*, very little smaller than the partridge of Europe. Senhor Lagoeira possessed several pointers, one of which always accompanied us, but, not being well trained, many of the birds escaped. Sometimes we visited the valley behind the house, which in several places is swampy, and abounds in a large species of palm, called Cabeçudo,* the fruit of which forms the principal food of the large blue Maccaw, which is very common in this district. In the marshes of this valley the Boa Constrictor is often met with of considerable size; it is not uncommon throughout the whole province, particularly by the wooded margins of lakes, marshes, and streams. Sometimes they attain the enormous length of forty feet: the largest I ever saw was at this place, but it was not alive. Some weeks before our arrival at Sapê, the favourite riding horse of Senhor Lagoeira, which had been put out to pasture not far from the house, could not be found, although strict search was made for it all over the Fazenda. Shortly after this, one of his vaqueiros, in going through a wood by the side of a small river, saw an enormous Boa, suspended in the fork of a tree which hung over the water; it was dead, but had evidently been floated down alive by a recent flood, and being in

* *Cocos capitata*, Mart.

an inert state, it had not been able to extricate itself from the fork before the waters fell. It was dragged out to the open country by two horses, and was found to measure thirty-seven feet in length; on opening it, the bones of a horse, in a somewhat broken condition, and the flesh in a half digested state, were found within it, the bones of the head being uninjured; from these circumstances we concluded that the Boa had devoured the horse entire. In all kinds of snakes, the capacity for swallowing is prodigious, I have often seen one not thicker than my thumb, swallow a frog nearly as large as my fist; and I once killed a Rattle-snake, about four feet long and of no great thickness, which had swallowed not less than three large frogs, one of which swelled out its sides to nearly twice the thickness of the other parts, it was still alive, and hopped away after it was liberated. I have also seen a very slender snake that frequents the roofs of houses, swallow an entire bat three times its own thickness. If such be the case with these smaller kinds, it is not to be wondered at that one thirty-seven feet long should be able to swallow a horse, particularly when it is known that, previously to doing so, it breaks the bones of the animal by coiling itself round it, and afterwards lubricates it with a slimy matter which it has the power of secreting in its mouth.

At other times we went into the forest that skirts the base of the Serra, in which the larger trees consist of a kind of *Mimosa* called Angica. On their branches were to be seen numbers of a beautiful little Marmoset monkey, attracted thither by a gum which this tree secretes, and of which they are very fond. Among the trees of

these forests were also seen some of the large howling monkeys (*Mycetes barbatus*, Spix.), which are known in Brazil by the names of Barbudo and Guariba; they possess immensely muscular power in their long prehensile tails, and even after being shot, and quite dead, they hang suspended by them from the branches. They generally appear in bands, making a disagreeable howling noise, particularly at an early hour in the morning. A little ring-tailed monkey (*Ateles paniscus*), is still more abundant, and is more persecuted by the fazendeiro, on account of the depredations it commits in his plantations. The cane and Indian corn-fields are those which they most frequently visit, whence they always carry off their plunder to the woods. An old Negro assured me he had often seen one of these animals carry with it not less than three spikes of Indian corn, one in its mouth, another secured by one of its arms, and a third held by its prehensile tail; I confess however, that before placing implicit faith in this tale, I must be a witness to the fact. The moist and marshy Campos produce various kinds of palm trees, which bear large clusters of small nuts, greatly resembling miniature cocoa-nuts. When ripe, these are covered externally with a fibrous oily substance, which has a sweetish taste, and constitutes the favourite food of these little monkeys, who are no less fond of the internal part of the nut, which contains a substance similar to that found in cocoa-nuts. In several parts of the interior I had been told, that to get at the kernel, the shell being too hard to break with their teeth, the monkeys carry the nuts to a rocky place, and then break them with a stone, and I even met with persons

who assured me that they had watched them in such places, through the bushes, and actually seen them engaged in this operation. This account, like that of the carrying away of Indian corn, I always considered to be fabulous till I arrived at Sapê. In an excursion we made over the Serra, immediately behind the Fazenda, where it is composed of nearly bare, rugged limestone peaks, in several almost inaccessible places we came upon large heaps of the broken shells of nuts, generally on a bare open part of the rock, and along with them a number of roundish pieces of stone, larger than the fist, which had evidently been employed in breaking the shells. These Senhor Lagoeira told me, were the places resorted to by the monkeys for the purpose of breaking the nuts collected in the low grounds; and that in his shooting excursions over the mountains, he has frequently seen them take flight on his approach. That they both can, and really do make use of a stone in order to break that which is too hard for their teeth, I have frequently witnessed in a little pet monkey that accompanied me on my journey; I obtained it in Piauhy, and it was the only one of the many tame animals I carried with me, that reached Rio de Janeiro alive; it was a female of the species we are now speaking of, and ultimately became very gentle. Jerry was the favourite with all, and indeed, in all respects fared like ourselves; it became so fond of tea, which it drank every morning and evening, that it would not go to sleep without its usual allowance. Its favourite food was farinha, boiled rice, and bananas, but scarcely anything came amiss to it; a raw egg was a choice morsel, and on being given to it, it broke one end by gently

knocking it on the floor, and completed the hole by picking off the broken bits of shell, and putting in the point of its long slender finger; throwing back its head, and holding the egg erect between its two hands, it soon contrived to suck out the whole contents. Whenever anything was given to it that was too hard to break with its teeth, it always looked about for a stone, and lifting it with one hand, by repeated blows would attempt to crack it; if unsuccessful by these means, it would try to find a larger stone, which it would hold in both its hands, and, rising erect on its legs, would let it fall, leaping backwards at the same time to avoid any injury to its toes. I have often watched the means it employed to obtain any small object that happened to be a little beyond its reach; if it could lay its hands upon a little switch, or slender twig of any sort, it would stretch itself out as far as its cord would allow, and continue working at the object till it got it within its reach. These operations were certainly often very awkwardly performed, but they were always interesting, from the amount of reasoning power which the little animal exhibited, and the perseverence with which its object was attained. Jerry almost always rode on the back of a large mastiff dog that accompanied us, and in this manner performed a journey of several thousand miles. These two animals were greatly attached to each other, and it was often an amusing sight to see them gamboling together. Before starting, the dog used to go, every morning, to the place where the little monkey was tied, and wait till it was put upon its back, and its cord made fast to his collar. In travelling, it was not at all particular as to whether its

face was towards the head or tail of the charger, except in going down hill, when its face was turned forwards, and to prevent itself from slipping over the dog's head, it made use of its long prehensile tail as a crupper, by coiling the extremity round the root of that of the dog. I had determined to bring Jerry with me to England, but, in taking it with me to the Organ Mountains, after my arrival at Rio de Janeiro, much to my grief, it disappeared one night, and was never afterwards heard of; it was stolen, I have no doubt, by one of the slaves, and sold somewhere for a mere trifle.

A few days before we arrived at Sapê, one of the slaves caught a young male monkey of this species. A number of these little animals had come to pay a visit to a plantation of Indian corn, several of them were females that carried their young on their backs, which they seldom quit till they are able to provide for themselves; being pursued by some slaves, in the heat of the retreat, this young one was thrown from its mother's back, and made prisoner, and was presented to me by Senhor Lagoeira as a companion for Jerry. I little expected it would pay any attention to the young one, but no sooner were they put beside each other, than the little one, fancying no doubt it had found its mother, crept up and secured itself on Jerry's back, and apparently seemed quite happy. Jerry instead of being ill pleased with this intrusion, became so much attached to it, that she would not allow any one to touch the young one; and seemed to have all the affection for it as if it had been her own. Several times I observed that when it came off her back to amuse itself on the ground, and was about to get out of her

reach, she would catch it by the tail and draw it back. During the first few days they were together, her breast became inflamed by the attempt the young one made to obtain milk from them; it seldom left her back, remaining there both day and night. It was amusing to see her cleaning it of fleas by laying it down on the ground, turning over its long hair, layer by layer, and catching between her fore-finger and thumb the insects as they made their appearance and then eating them; when they were difficult to take in this manner, she would catch them between her teeth at once. During this operation the little one would lie as quiet as if it had been sleeping. It only lived a few weeks after we reached Arrayas, and I was surprised that although so much attachment was shown to it by the old one while it was alive, not the least symptom of grief was exhibited at its death.

In the densest parts of the forests near Sapê, the *Jacutinga* (*Penelope Jacutinga*, Spix), the fine large game bird which is so common in the forests of the Organ Mountains, was not unfrequently encountered in our walks, and brought home as trophies. The mountains here, as already mentioned, are composed entirely of a compact primitive limestone, similar to that existing at Natividade, and which I afterwards found extending many leagues to the southward. The lower parts of these mountains are tolerably well wooded, but the upper parts consisting of sharp rugged peaks, surrounded by broken masses at their bases, are nearly destitute of vegetation, the only plants found here being a small wild Fig tree, a large prickly *Cactus*, a shrubby *Trixis*, a small *Begonia*, and a stinging *Loasa*. The heaps of broken rocks which exist

around the bases of the peaks, are frequented by vast numbers of a small animal, greatly resembling a rabbit, and about the same size; it is allied to the Guinea-pig, and its flesh, which is white, is very good to eat. It is the *Kerodon moco* of naturalists, and is well known to the inhabitants by the name of Mocó.

It was on the afternoon of the twenty-sixth of February, that we left Sapê for Arrayas, and after travelling two rather long leagues, we reached the foot of the Serra, at the point of ascent to the upland plain in which the Villa is situated Here we bivouacked for the night, slinging our hammocks among some trees, by the side of a little stream which came from the mountains. On this journey, after leaving the more densely wooded tract which surrounds Sapê, we entered a wide open valley, situated between the Serra de Santa Brida and that of Buriti, which gradually became narrower until the two Serras united at the place of our encampment. This valley is very thinly wooded, except along the margins of the many small streams which intersect it, and which join to form a small river that flows through its centre. I found this locality particularly rich in botanical productions, as it abounded with elegant flowering shrubs and trees, such as *Pleroma, Crotalaria, Bauhinia, Diplusodon, Vochysia, Kielmeyera, &c.* The ascent of the Serra, which was accomplished on the following morning, we found both long and tiresome, and very rocky. From the top of the Serra to the Villa, which is a league and a half distant, the road is of gentle declivity. I carried a letter from Senhor Lagoeira to a schoolmaster, who in a short time found an empty house for our accommodation, of a

very inferior description, and little calculated to keep out either wind or rain, it was, however, the only one that could be obtained. Here we remained for about a week, until another, which on our arrival was occupied by a travelling merchant, became empty; it was far superior, and now fell to our use. As the season of rain was not yet nearly terminated, I remained in Arrayas nearly two months, during which time I amassed a splendid collection of the curious and beautiful plants, which are peculiar to the upland grassy campos of the interior of Brazil.

The Villa de Arrayas is very pleasantly situated in a hollow on the table-land of the Serra; it is surrounded nearly on all sides by low grassy hills, which are but thinly wooded with small trees and bushes. The highest of these hills are towards the N.E. side of the town, and from behind them flows a beautiful stream that at all seasons supplies it with water; the inhabitants have a saying, that the place has neither bad water nor good roads (em Arrayas não tem agoa roim, nem caminhos bons), and this is truly its characteristic. The town is of very small size, the population not exceeding three hundred inhabitants, great and small. Here, as in the other towns in the interior, many of the houses belong to the fazendeiros, who only occupy them during the festas; they are nearly all arranged before a large square, on the east side of which the only church is situated. On our arrival I was surprised to observe a house with glazed windows, a rare sight in the interior of Brazil, but on nearer inspection, I found that the place of glass was supplied by plates of talc, which is found abundantly in this neighbourhood.

During my stay among the people of this place I found them universally kind and obliging, so far as their limited means permitted, for the greater part are very poor; in most instances, however, this poverty is occasioned by their own indolence. It was with great difficulty that we could purchase any thing in the shape of provisions, and it is still a mystery to me, how the great mass of the inhabitants contrive to live; had it not been for the kindness of my good friend Senhor Lagoeira, who again sent me supplies of provisions, we should often have been in a state of starvation. Notwithstanding the smallness and the poverty of the place, it contains two priests, neither of whom seemed to be the worst fed of the community. There are three public schools, two of which are elementary, one for boys, the other for girls; in the third, Latin only is taught. Here, as in all the other towns and villages in the interior, the teachers are paid by government, and, consequently, the education of all classes is gratuitous; notwithstanding this, I was surprised to see the small number who take advantage of so favourable an opportunity for the education of their children. Those who live in the country, and who send their children to school, are obliged to board them in the town, which is generally looked upon as a great grievance. Here, as elsewhere, I met with very few who have a taste for reading, and generally, the only books they possess, are some small volumes of orisons. Even the libraries of the priests are confined to a few religious and classical works; and among these, a bible is rarely to be met with, a mere abridgment of it supplying its place.

The rocks which compose the mountain range on which

the town of Arrayas stands, all belong to the primary strata; these are nearly vertical, the little inclination which they present, being towards the east, that being the direction of the highest part of the Serra. The most westerly of these rocks have an arenaceous schistose structure, and these overlay a very compact greyish-coloured stratified rock, very much resembling gneiss, in which are imbedded innumerable rounded pebbles of granite and quartz, of all sizes from one to three or four inches, and which is probably equivalent to the grauwacke rocks of the old world. The lime-stone of which the western side of the Serra is composed at Sapê and Natividade, is not found here, but I again met with it to the south; in none of the rocks did I observe any appearance of organic remains.

From its elevated situation, the climate of Arrayas is much cooler than in the plains below, and the rains are both heavier and of longer duration; these always come from the N.E., beginning in October or November, and continuing till the month of April, or until a regular S.E. wind sets in, which is the first signal that the dry season has commenced. The rearing of cattle is the most ordinary occupation of the fazendeiros, their cattle meeting with a ready sale in the Bahia market, but they generally also cultivate a little sugar cane, principally for the manufacture of rum, which is extensively used among all classes of society, and of course meets with a good sale. Mandiocca, rice, and Indian corn, are also cultivated, both for family use, and for sale in the Villa. All these productions, however, are grown in the low countries, principally along the foot of the Serra; around the Villa itself

little or nothing is cultivated, notwithstanding that the soil in many places is favourable for small plantations; both the climate and soil seem well adapted for the production of coffee, as the few small plantations that have been attempted, yield good crops, without any care having been bestowed on them; in the garden belonging to the house in which I lived, there were about one hundred and fifty coffee plants, which in the end of April were loaded as heavily with fruit, as any I have seen in the large plantations in the province of Rio de Janeiro. This article, however, can never be cultivated here to any extent, with a view to exportation, on account of its great distance from the coast. The Rio Tocantins offers the only water conveyance, and that as yet is only navigable for canoes of small burden. There are only two shopkeepers in the Villa, both of whom bring their goods from Rio de Janeiro. They go there once in two or three years, the entire journey generally occupying from six to to nine months.

The diseases of this district are very similar to those which are common in the more northern part of the province. In the low country, which during the rainy season, is full of marshes and swamps, intermittent fevers are prevalent, and are often fatal to those coming from the upland districts. As very few only can afford to purchase sulphate of quinine, the general mode of curing these fevers, is by emetics and purgatives, and occasionally by bitter barks, obtained from the trees in the woods; of these one most commonly used, is procured from the *Strychnos pseudochina* of St. Hilaire, a small tree which grows on the upland campos. A strong infusion

of coffee with a mixture of salt is also sometimes administered. Though the inhabitants of the plains are constantly subject to the fever, they seldom die of the disease itself, but the effects which it produces on the constitution after a long series of yearly attacks, ultimately cut off a great many. The principal organ that becomes affected, is the spleen, which is sometimes so much enlarged, that it nearly fills the whole abdominal cavity; when travelling in these districts, we seldom arrived at a house where I was not consulted respecting enlargements of this organ. The liver is more rarely affected, its affections are generally produced, by intemperance in eating and drinking, and by the constant and immoderate use of tobacco. In the Villa intermittent fevers are unknown, in consequence of its being situated above the region of miasmata, unless they appear in cases where the infection has been imbibed below. The traveller before alluded to, who gave up the house to our use, left behind him an Indian servant, with no one to attend to him, and whom I found almost dead from the attacks of a severe tertian ague, but who soon recovered after being properly treated. This poor fellow was a native of the banks of the Amazon, and he remained in my service until my arrival in Rio de Janeiro. These fevers very often lose their intermittent character, and assume a malignant remittent nature. The prevailing diseases in the Villa are ophthalmia, colds, inflamatory complaints, rheumatism, and dyspepsia; paralysis also is common; and as a preventive, nearly all the people wear a thick twisted iron ring, made on the Saturday of the passion week (sexta feira da Paixão), and blessed by a priest. Goitre is common, but not nearly

so much so as in Natividade and Conceição. Here they attribute it to the coldness of the water they use for drinking.

The country around Arrayas affords many prospects as highly picturesque and pleasing to the eye of a common observer as to that of the naturalist; to the latter, however, it offers a double charm, owing to the great variety in the objects which such diversity of soil and situation present for his investigations. My excursions in various directions yielded me upwards of three hundred species of plants, all different from any I had elsewhere collected. The dry upland Campos afforded numerous grasses, which are nearly all coarse and rank, and not well suited for pasturage; these grasses do not form a close turf, as in Europe, but grow in scattered tufts, leaving greater intervals of bare soil than the amount of surface actually covered by them; this, however, is not apparent at first sight, for the culm is generally long, and when ripe, and seen from a distance, the Campos appear as if covered with wheat or oats. Many flowering shrubs and beautiful herbaceous plants are found growing among the grasses; of the former *Diplusodon* and *Kielmeyera*, are the most ornamental; one of the latter, (*Kielmeyera rosea*, Mart.) grows in bushes about a foot and a half high, and produces numerous large rose-coloured flowers, from which it has obtained the name of Rosa do Campo. Of the herbaceous plants of these tracts, the most beautiful are those belonging to the Gentian tribe. A species of *Lisianthus* produces large blue bell-shaped blossoms, not unlike those of the *Digitalis* in shape; and towards the end of the rainy season, the fields

are gaily adorned with two elegant species of *Callopisma*; one of these is more abundant than the other, and being intensely bitter, is used medicinally as gentian by the inhabitants of Goyaz, who collect it when in full flower, dried bundles of it being seen hanging up in almost every house; it is used, in infusion, in dyspepsia, and also to strengthen those who are recovering from fever. The trees of the upland Campos are mostly small, consisting chiefly of the beautiful Sicupíra (*Commilobium polygalæflorum*), *Qualea grandiflora*, and *Q. parviflora*, a *Vochysia*, *Salvertia convallariodora*, a *Panax*, an *Albertinia*, a *Lafoensia*, two species of *Cecropia*, the Mangába do Mono, the Cashew, and several species of *Mimosa*.

Towards the latter end of the month of April, the whole north of the province of Goyaz was thrown into a state of alarm, in consequence of information received from San Pedro de Alcantará, a small town in the extreme north of the province, near the banks of the Rio Tocantins, that a party of the troops of Raimundo Gomez, and the Balaio had crossed over from Pastos Boms in the province of Maranham, to Alcantará, and taken it by force; and that although the greater part of the more respectable inhabitants had fled to the woods, a number had been killed and robbed, while others had joined the rebels. Notice arrived at the same time that all the canoes which had descended from the central parts of the province towards Pará (April being the month in which they generally start), were taken, the owners killed, and the hides with which they were laden thrown into the river. It was immediately surmised that the canoes were captured for no other purpose than to ascend the river in

order to devastate the towns and villages in this quarter, in the same manner as they had attacked those below. On the 22nd of April I was called to a Fazenda about three leagues to the north of Arrayas, to visit a young lady, who was indisposed. When I arrived there, her father had just received a letter from the Vigario of Conceicão, stating that a few days before, the robbers had reached Porto Imperial, a village on the Tocantins, only three days journey from the Villa de Natividade, and that the inhabitants of the latter place were flying to the woods in all directions. On my return to Arrayas, he sent by me a letter to the President of the Camara Municipal, containing the above information, who immediately called a meeting of the principal inhabitants to take into consideration what steps were necessary in this exigency; it was agreed that the National Guard should be called out by beat of drum, but although the town possessed such an instrument, unfortunately there was no one able to use it, until one of my men, a black from Natividade, asked my leave to offer his services. Accordingly the drum beat to arms round the town, but not more than half a dozen men made their appearance. Next morning they were again called out, when about a dozen assembled, nearly all without arms. These few were immediately put under drill by a Fazendeiro who happened to be in town, and who although bearing the rank of ensign in the National Guards, appeared quite ignorant of the task he undertook. The Juiz de Paz was immediately summoned from his Fazenda, and expresses sent off to the city of Goyaz to inform the President, as well as the intermediate towns; orders were likewise issued to the different parts

of the district to assemble the whole of the National Guard. In the course of four or five days above a hundred and forty men appeared in the Villa, the greater part of them armed with their own fowling pieces, but there were no muskets, gunpowder or ball in the place. Those who had no guns, armed themselves with their long knives, firmly tied to the ends of short poles; like the troops of Piauhy, they formed the most motley group imaginable, being of all colours, of all sizes, and without any uniform. They remained under drill for about eight days, at the expiration of which time, news arrived that the previous information had been premature, and that the rebels amounting to about five hundred men, all well armed, were still in Alcantará. Immediately on receiving this information, the Juiz de Paz dismissed his troops, with the exception of ten men, kept as a guard for the protection of the Villa. In proportion to the number of inhabitants which this district contains, the number of National Guards assembled on this occasion, was greater than in any of the districts of Piauhy; but I had doubts whether one half of them would have responded to a second call, as these poor fellows who had been suddenly called away from their houses and families, most of them after a long journey which they had to make on foot, were not satisfied with the treatment they received from the authorities, for they found on their arrival, that no accommodation had been provided for them, except an old house, the walls of which were raised but little above the ground, where, more like pigs than human beings, they were all stowed together. Had the weather been fine, the greater part of them would have preferred sleeping in the open air, but

unfortunately much rain, at this time, fell at night. Moreover, during the whole of the period they remained in the Villa, not one sixpence was expended in procuring provisions for them, and had it not been for the charity of some of the inhabitants, they would certainly have either starved, or been driven to take food by force. When some of them applied to the Juiz de Paz for provisions, he told them he did not like to appropriate any of the funds belonging to the town to such a purpose, as these were absolutely required for the erection of a new jail, which they had in contemplation! A few hours before their dismissal, they mustered in the church to hear mass, after which the Juiz de Paz gave each of them a glass of rum, and this was all the remuneration they received for their services. When the news first arrived that the rebels had reached Porto Imperial, several of the inhabitants of the Villa, who had previously boasted of the feats of bravery they would perform, should the enemy advance as far south as Arrayas, were the first to pack up their valuables, in readiness to decamp on a short notice; and none of the women were now to be seen with the rings on their fingers, or in their ears, or with the gold chains which they usually wear round their necks.

The proper season for travelling having now arrived, I became desirous to resume my journey, so as to reach Rio de Janeiro, if possible, before the setting in of the next rains. Thanks to the kindness of my excellent friend Senhor Lagoeira, who supplied me with the greater portion of our provisions from his Fazenda, my funds had not been much encroached on during our stay in Arrayas. By my profession, I gained even more than was expended,

by which I was thus enabled to add four fine horses to my troop, which now therefore amounted to sixteen in all. On the 4th of May I went to Sapê, to take leave of my friend, and to bring back my horses which had been pasturing there since our arrival; knowing that I was about to leave, he had prepared an ox, and other articles of provision for our journey. The parting with this truly good person, with whom, in a strange land I had lived on terms of intimacy, from whom I had experienced kindness that I could never have expected, and with whom I had no earthly chance of again meeting, produced a feeling of depression which hung over me many days after my departure.

CHAPTER XI.

ARRAYAS TO SAN ROMÃO

Departure from Arrayas—Reasons for preferring the Route along the Serra Geral—Passes Gamelleira—Bonita—Reaches San Domingo—San Joao—San Bernardo—Curious Fact respecting the Rio San Bernardo—Passes Boa Vista—Country consists of very elevated table-lands—Its Natural Productions—Arrives at Capella da Posse—San Pedro—San Antonio—Dôres—Riachao—Animals greatly tormented by large Bats—Habits of these Vampires—Reaches San Vidal—Flight of Locusts—Passes Nossa Senhora d'Abbadia—Campinhas—Pasquada—San Francisco—Crosses River Carynhenha and enters the Province of Minas Geräes—Country described—Habits of the great Ant-eater—Passes Capao de Casca—Descent of the Serra das Aráras—reaches San Josè—Rio Claro—Boquerao—Santa Maria—Espigao—Taboca—San Miguel—Crosses River Urucuya—Passes Riachao—Arrives at San Romao—Town Described—Its Population—Habits of the People—Rio de San Francisco—Description of the different varieties of the Salmon tribe found in it.

The necessary preparations having been completed, we started from Arrayas on the afternoon of the 6th. of May, my object being now to reach the Villa de San Romão on the Rio de San Francisco; but instead of proceeding southward along the western base of the Serra Geral as far as the parallel of San Romão, the road usually followed by the people of the country, I preferred the less frequented, and consequently the more difficult route, that leads along the Serra itself. My reasons for adopting

this plan were, in the first place, because the low country to the westward, had already been travelled over by Pohl and Burchell, and partly by Spix and Martius; and secondly, because I always preferred elevated regions, on account of the greater diversity of vegetation met with in such situations. We were accompanied for about half a league out of the Villa, by a few of the more respectable inhabitants. Shortly after the return of my friends, we descended the Serra on which the Villa stands, by a very rocky path, but this descent was not nearly so great as the ascent on the opposite side, and although we now found ourselves in a comparatively flat country, we were still at a considerable elevation. After proceeding half a league, we encamped for the night under some trees by the side of a small stream; here we slung our hammocks, but soon after midnight the cold became so great, from the wind that blew down from the Serra, that we could not sleep; and long before daybreak we were glad to rise, and seat ourselves round a large fire, such as we always made it a rule to burn every night we slept in the open air.

A journey of four long leagues on the following day, brought us to the Fazenda Gamelleira, where we passed the night under a large fig-tree, there being only one small house belonging to the Vaqueiro. This Fazenda belongs to a widow lady, Dona Maria Rosa, at whose house we spent some time during the middle of the day. Soon after leaving Gamelleira, we entered a virgin forest quite unlike any I had seen since leaving the Province of Rio de Janeiro, and which I little expected to find in the district where we were now travelling. It contained many large trees, covered with numerous parasitical *Orchideæ*.

The forest was about a league in length, after which we entered upon an elevated thinly wooded tract, where we halted to breakfast under a beautiful shady wild-fig (Gamelleira). In the afternoon we accomplished another two leagues, and passed the night at a Fazenda called Mangê, the road leading over a thinly wooded Chapada.

On the morning of the 9th, after a ride of a league and a half, we rested on the banks of a small brook under a group of Buriti palms. The first part of our journey we found to be hilly and stony, with intermediate well wooded low tracts, but the latter part of it was through a most beautiful country of fine open grassy Campos, with occasional large wide-spreading trees. In the afternoon, we travelled a league and a half through a country even still more beautiful than that through which we passed in the morning. We ascended a slight elevation that led to a flat Chapada, rather thinly wooded, abounding in a rank kind of grass, a species of *Andropogon*, growing in large isolated tufts, and about three feet high, after passing through which, we entered an open Campo country. From the termination of the Chapada, there is a fine view of a large Serra, which runs from north to south, but not of great elevation and almost perfectly level as far as the eye could reach; this is the western side of the most elevated portion of the Serra Geral. It was not till some time after sun set, that we could find a convenient place for encamping, but the moon shone brightly, and we proceeded without inconvenience. The place where we halted at last, was under some small trees near the side of a wood, but we little anticipated the plague we were

about to encounter; in half an hour we discovered that it was swarming with the Carrapato Miudo, and so numerous that our bodies were soon covered with them. As it was now too late to shift our quarters, our only remedy was to set fire to the grass around our encampment. This being done we washed ourselves with a strong infusion of tobacco, which destroyed the Carrapato, and then with tepid water to prevent any bad effects from the tobacco, a remedy usually adopted by the Vaqueiros whose occupations lead them daily into places infested by these annoying insects. Having thus secured ourselves from any further attacks from this pest, we slept soundly, and resuming our journey early next morning, we travelled three leagues and a half through a flat sandy bushy country, reaching about mid-day a small Fazenda called Bonita, where we remained till the following day. The small house belonging to the proprietor of this Fazenda is situated on a slight eminence, which commands a fine view of the surrounding flat country. He formerly lived in a somewhat lower spot at a little distance, but as his family suffered constantly from ague, he removed to this place, since which they have been free from this complaint, although the difference of elevation is not more than a hundred feet.

In the morning the Juiz de Paz of the district, who lives about two leagues to the north of Bonita, passed, and learning that we were strangers, and about to visit the Arraial de San Domingo, a little village two and a half leagues distant, he told me that he was on the way thither himself, and that his own house, which he only occupied during festa times, was much at my service

during my stay there. The distance betweeen Bonita and the village is said to be two and a half leagues, but they proved to be very long ones. The road till within a short distance of the village is pretty level, and generally sandy, but it afterwards became more hilly and stony; it leads southward along the base of the Serra Geral, but generally a mile or more to the west of it; the top of the Serra still continued to be level with a precipitous face, the rock being of a reddish-yellow. Shortly after leaving Bonita, an elevated pyramidal peak of the same elevation as the Serra, is descried to the S.E. presenting a remarkable resemblance to some enormous work of art; it stands about a quarter of a mile distant from the Serra, and is placed upon a broad regular base.

We reached the Arraial de San Domingo a little before sunset, and took up our residence in the house of the Juiz de Paz. Like the rest of the houses it was built of large unburned bricks, with the partitions formed of wicker-work, plastered with clay, smoothed by the hand of the operator, and ornamented all over with the strokes left by his fingers. The village stands among some small hills about a league to the west of the Serra Geral; it is very insignificant, containing only about forty houses, a great many of which, belonging to the Fazendeiros, are untenanted, except during the festas; a small limpid stream runs near it, which flows with great rapidity, but it contains no fish, as they are prevented from ascending by a cataract which exists at some distance below the village. We remained here two days, endeavouring to hire another man to assist in the management of my troop, but I had much difficulty in finding one, not-

withstanding there were plenty of young men idling about, who had no disposition to work for a livelihood. It is a common saying in these parts, that for every ten who work, there are ninety who do nothing, and maintain a wretched existence by hunting, and robbing their more industrious neighbours. Having heard of a man who had already made a journey to Minas Geräes, I sent for him, and found him willing to engage with me; but, just as we were concluding the agreement, his wife came up and abused me violently for enticing her husband away from her; she was a large mulatto woman, old and ugly, and what very much surprised me, a slave, while he, who was also a mulatto, was a freeman, and considerably younger. They had done little but quarrel during the six years they had been married, and he seemed now determined to get rid of her; he therefore told her, that though she had governed him for a very long time, she should do so no longer. We could not, however, get rid of her, till he promised that he would not remain more than a month with me; when that time expired, he did not feel inclined to return, but went on with me to the Gold District, when he got employment at one of the mines.

Everything being at length arranged, we started early on the morning of the 14th, and travelling southward, still keeping on the eastern side of the Serra, we arrived, on the forenoon of the following day, at a Fazenda called San João, and as our provisions were nearly exhausted, I determined to obtain a fresh supply here, if possible. On making enquiries of the owner, he informed me that as he had no cattle near the house, it would be two or

three days, at least, before a cow or ox could be brought from a pasture, which was seven leagues distant; to this of course I was obliged to consent, as we were now in a country where provisions were not easily obtained. In the afternoon I went down to bathe in a little stream which passes at some distance from the house, and, seeing a plant in flower among some bushes on the bank, I went in among them to collect it, but when I came out again, I found that I had paid dearly for so doing, as my trowsers and shirt, as well as my hands and legs, which were bare, were thickly covered with small Carrapatos. As no time was to be lost I again took off my clothes and rushed into the stream; it caused me much trouble to clear my shirt and trowsers of these annoying insects, and I afterwards took great care not to walk much about in this neighbourhood. It was not till the morning of the second day that a fine fat cow was brought, and although killed immediately, the flesh was not dry enough to be packed for two days more. The owner of the Fazenda, Captain Faustino Vieira, we found to be of a very niggardly disposition, and much less hospitable than the Fazendeiros I had generally met with in this province. Although his house was a good aud commodious one, we had during our stay, to put up in an open shed, which served to cover the sugar mill belonging to the farm. He was most exorbitant in his charges for all we had purchased of him, requiring one half more for the cow than its usual price in that part of the country; he charged in like manner for the Farinha, and the Indian corn for my horses,

On the day we left San João, we made a journey of

three long leagues, and put up for the night at the Fazenda de San Bernardo. During the afternoon, one of the horses in passing between two trees broke his pack-saddle, and it was necessary to remain here half the following day, in order to get it properly repaired; in the interval, I went out to botanize near a large marsh, through which a small river runs. This river, as well as several others about the same size, which we passed both before and after we left San João, lose themselves beneath a low Serra of limestone which runs parallel with the Serra Geral, and nearly two leagues to the west of it. These rivers take their rise in the Serra Geral, and are said to enter beneath the range before mentioned, where they all unite, and at the distance of three leagues still further to the westward, they again appear above ground in one stream, forming the Rio de San Bernardo, which afterwards falls into the Rio Parannan. A person belonging to the Fazenda, took me down to see the spot where the stream that passes this place, disappears in the mountains, when contrary to what I expected, I found that it did not enter by an open cave, but by an aperture, far below the surface of the water, forming what the Brazilians call a Soumidouro; the current here runs with considerable rapidity, strikes against the nearly perpendicular face of the limestone rock, and forming a few whirlpools, is lost in the gulf below. By these streams the remains of many of the animals of the country must be entombed in the deep caverns through which they pass, and it is not impossible that such deposits may at some distant epoch, form themes for the speculation of future geologists. As it was late in the afternoon before

we left San Bernardo, we could not complete more than a league of our journey, through a country very similar to that on the other side of San Domingo. Next morning after accomplishing a very long league and a half, we rested to breakfast at a little habitation called Boa Vista, but inappropriately named, for not only is it situated in a hollow, but is surrounded by trees. The house had a miserable appearance, but the old woman to whom it belonged offered us much civility and attention, and gave us some sweet limes, which we relished exceedingly after our exposure to a burning sun. The country here is of an undulating character, and rather thickly wooded, though the soil is poor, being very sandy. During these journeys, my collections were much increased by the addition of many fine shrubs and herbaceous plants, the dry sandy Campos abounding with numerous species of *Diplusodon*, elegant little shrubs with rose-coloured flowers; while the moister portions afforded a rich harvest of curious varieties of *Eriocaulon*, having little resemblance to our humble British species, being tall and branched, and very remarkable from the large white balls of flowers, which each branch bears at its extremity. In the afternoon we made another journey of two leagues, the road being through a hilly elevated country, in which we met with several gradual ascents, that always terminate in flat sandy thinly wooded Chapadas. After travelling about a league, we came very close to the Serra Geral, and continued our journey along its base, till we reached a convenient spot where we encamped under some trees by the side of an open swamp, in the centre of which grew a large grove of Buriti palms; we had been gradually

ascending, for we were not more than two hundred feet below the summit of the Serra; our elevated situation, and a smart breeze which began to blow after sun-set, caused us to pass a colder night than we had done for some time.

Another journey of two long leagues, brought us about mid-day to the little village of Capella da Posse, our route leading us through a beautiful up-land country. It was for the most part of an undulating character, the road sometimes passing through large open Campos, containing small clusters of Buriti and other palms, at others through densely wooded hollows, and not unfrequently along the bushy margins of open sandy marshes, abounding in curious *Eriocaulons*. Within a few miles of Posse, the mountain range takes a sweep to the S.E., and the road consequently diverges from the Serra, to gain the village, laying to the southward, which is surrounded by a flat, arid, and very sandy country, covered with a few scattered stunted trees and shrubs. The village we found to be of the most miserable description; it contains about a dozen small houses, and a very little church, the place is so poor, that it cannot support a priest, for one who came to settle among the inhabitants, about a year before our visit, left, because they either could not, or would not, pay him more than half the salary he was promised. It was late on the following day before we left, as I remained to arrange the large collection made between San Domingo and this place. Hitherto we had avoided travelling along the upper part of the Serra, on account of the difficulty of finding water, but beyond Posse, the comparatively flat sandy country merges into the mountain

range, and our course was therefore now in a S.E. direction. On the second night after our departure, we arrived at a little hamlet, about five leagues distant, called San Pedro; it consists of about half a dozen small houses, and a little chapel. We passed the night in an open shed, between two of the houses, and on rising in the morning, Mr. Walker missed some of his clothes; it was very fortunate that nothing else had disappeared, for we were afterwards informed that the whole place was little better than a nest of robbers. The Fazendeiro who gave us this information, said that whenever he had occasion to sleep there, and had money with him, he always hid it in the bush at some distance until the morning. During the whole of my travels, I always avoided sleeping in the open air, if possible, whenever two or three houses were seen together, otherwise some little thing or other was always sure to disappear; indeed, in the dry season, and where the country suited, it was always preferable to encamp at some distance from any habitation, especially in the thinly inhabited districts. Next day we only travelled a league and a half, and passed the afternoon and night at the Fazenda de San Antonio, the owner of which was a coloured man, and very hospitable. Leaving this place early in the morning, a journey of two very long leagues brought us to the next Fazenda, called Dôres, but we found that for some time it had been deserted by its inhabitants. The country through which we passed, on our journey there, was nearly one continued elevated sandy plain, with occasional large open marshy Campos, but these only existed where any slight declivity was seen. About half way we came to a long narrow valley,

in the centre of which was observed a small and very deep river, with a rapid current, over which we passed by a wretched old bridge, formed of the trunks of two trees, traversed by smaller branches very loosely laid together, so that I was glad when I saw the last of the horses safely across, on account of the great risk of their feet slipping between the cross sticks. In the afternoon, we went a league further to a Fazenda, called Picada, which, like most of the houses we had lately seen was very small; it belonged to a mulatto, with a family, who seemed to be in no very affluent circumstances. Among the numerous plants collected on these journies, was one, the root of which is celebrated by the inhabitants of these districts, as a cure for the bite of the Rattle-Snake. It is a suffruticose species of *Trixis*, about four feet high, with rather large clammy leaves; the root has a musky smell, and it is even said that the smell alone is sufficient to kill a snake; they call it Raiz da cobra.

We started from Picada early, but did not proceed more than a league, being detained on the road by an accident that befell the Indian guide I had hired at Arrayas: he was walking behind another of the men, who was mounted on a spirited young horse, when on a sudden, probably from the sting of some insect, it started, casting up its heels in the air, and after striking the poor Indian a violent blow in the stomach, set off at full gallop, throwing its rider, but without doing him any harm. I sent forward the troop in charge of Mr. Walker, while I remained behind to attend to the Indian who seemed to be in much pain; he was greatly relieved by a little water for which we had to wait a long time before it could be

procured, he was then placed on a quiet horse, and led slowly to the nearest house, two miles distant, but by the time we reached it, he became so weak, that his pulse was scarcely sensible. After giving him a cup of strong warm tea, the only stimulus that was to be procured, his pulse rose considerably, when I bled him in the arm, which relieved him greatly; and he gradually recovered, so that we were enabled to resume our journey in the afternoon of the following day.

We stopped at a place called Riachão, which consisted of three houses, about a quarter of a mile distant from each other. Here, for the third time only since we left Arrayas, I was able to purchase some Indian corn for my horses, they stood in much need of it, as the pastures were now very poor, consisting of coarse dry innutritious grasses. The inhabitants of this district are so desperately lazy that they scarcely plant sufficient of any thing for their own use, notwithstanding the unlimited extent of ground that each family possesses. For several nights before we reached this place, the horses were greatly annoyed by bats, which are very numerous on this Serra, where they inhabit the caves in the limestone rocks; during the night we remained at Riachão, the whole of my troop suffered more from their attacks, than they had done before on any previous occasion. All exhibited one or more streams of clotted blood on their shoulders and backs, which had run from the wounds made by these animals, and from which they had sucked their fill of blood; when a small sore exists on the back of a horse, they always prefer making their incision in that place. The owner of the house where we stopped, informed me that he was not able to

rear cattle here, on account of the destruction made by the bats among the calves, so that he was obliged to keep them at a considerable distance in a lower part of the country; even the pigs did not escape their attacks.

The singular creatures which are productive of so much annoyance, constitute the genus *Phyllostoma*, so named from the leaf-like appendage attached to their upper lip; they are peculiar to the continent of America, being distributed over the immense extent of territory between Paraguay and the Isthmus of Darien. Their tongue, which is capable of considerable extension, is furnished at its extremity with a number of papillæ, which appear to be so arranged, as to form an organ of suction, and their lips have also tubercles symmetrically arranged; these are the organs by which they draw the life-blood both from man and beast. These animals are the famous Vampires, of which various travellers have given such redoubtable accounts, and which are known to have nearly destroyed the first establishment of Europeans in the new world. The molar teeth of the true Vampire or spectre bat, are of the most carnivorous character, the first being short and almost plain, the others sharp and cutting, and terminating in three and four points. Their rough tongue has been supposed to be the instrument employed for abrading the skin, so as to enable them more readily to abstract the blood, but zoologists are now agreed that such supposition is wholly groundless. Having carefully examined, in many cases, the wounds thus made on horses, mules, pigs and other animals, observations that have been confirmed by information received from the inhabitants of the northern parts of Brazil, I am led to believe that

the puncture which the Vampire makes in the skin of animals, is effected by the sharp hooked nail of its thumb, and that from the wound thus made, it abstracts the blood by the suctorial powers of its lips and tongue. That these bats attack man, as well as animals, is certain, for I have frequently been shown the scars of their punctures in the toes of many who had suffered from their attacks, but I never met with a recent case. They grow to a large size, and I have killed some that measure two feet between the tips of the wings.

It was late in the afternoon when we left Riachão, and we halted about a league beyond it, under some trees by the side of a small marsh, having been informed that the next watering place was more than a league further on. We were now travelling along the Chapada, or flat top of the Serra, and I observed that the little streams we had been crossing for some time, all flowed to the eastward, to empty themselves into the Rio de San Francisco. We suffered from the cold during the night, and were besides much annoyed by a large species of Mosquito, the bite of which was very painful, and on the following morning our hands and faces were greatly swollen in consequence. We did not get away from this place till about mid-day, owing to one of the horses having strayed to some distance, but this loss of time was compensated by successful botanizing made in the neighbourhood. We now passed through a rather dense wood in a hollow, the road being dreadfully bad, in consequence of the great number of large rocks of limestone abounding there. The remainder of this morning's journey of a league and a half, was through a flat, open and rather sandy country, when we

halted for a short time by the side of another marsh, which afforded both water, and good pasturage for the horses. In the afternoon we accomplished a further distance of two very long leagues, and spent the night at a small Fazenda called San Vidal. Two leagues beyond this place, we reached the banks of a small river, too deep to allow of the horses passing with their loads. We were told at San Vidal that we should find a bridge, but we met with only the remains of one; after much trouble in searching along the swampy banks, we found at length a spot that answered as a ford, where all the loads were carried over on the men's heads, a task which occupied about an hour and a half. We halted on the other side of the river, under the shade of a large *Vochysia*, which was then covered with its long spikes of yellow flowers. During the time we lost in crossing, and for more than an hour afterwards, an immense flight of a large greyish coloured locust, passed from south to north. They did not keep continuously on the wing, but alighted and rose again at short intervals, and thousands of them which fell into the stream, were carried down by the current; they did not fly above twelve feet from the ground, and their constant rise and descent, gave the air very much the appearance of falling flakes of snow. The country through which we passed after leaving San Vidal, is nearly one continued flat, sandy, bushy plain, thinly wooded in some places with small trees, among which occasionally appeared a fine palm, with a stem about twelve feet high; large tracts had lately been burned according to the general custom at this season. In many places these sandy plains were beautifully adorned with

a dwarf species of *Diplusodon*, covered with rose-coloured flowers, and small leaves, greatly reminding me of the heather of my native country. A *Vellozia*, with a stem about four feet high, was also very common, as well as several elegant stemless palms. In the evening we went on about a league and a half, and passed the night under some trees by the side of a small river, very similar to that we crossed in the morning. During the whole of this day's journey, we were greatly annoyed by the numerous stragglers of the flight of locusts that were following their companions, and which sometimes nearly blinded us, by striking against our faces. My little monkey amused herself by catching them as they passed, and they appeared a favourite food with her; to prevent their escaping, for she had frequently three at a time in her possession, she secured them by biting off their heads as soon as they were caught.

The river on the north side of which we slept, was very deep, and I was greatly annoyed to find that a small bridge, that had been thrown across it, had been nearly carried away by the floods, so that we were again put to the trouble of having all the luggage carried over; this occupied about an hour, when we lost no time in resuming our journey, in the hope of reaching some habitation, where I could ascertain whether we were on the right path towards a little hamlet through which I wished to pass, called Nossa Senhora d'Abadia. After leaving the river, we ascended a low hill, on the top of which is a somewhat thickly wooded Chapada, and we spent nearly half an hour in crossing it. Having accomplished this, we saw at some distance in a hollow, a few small houses

with a church, which proved to be the little hamlet we were in quest of; it consisted of half a dozen miserable small huts formed of wicker-work and clay, and thatched with palm leaves, the church being also constructed of the same materials; the houses were all in a state of decay, and uninhabited, with the exception of one, in which we found a Mulatto woman and a few children. I had hoped to procure here some corn for my horses, but none was to be had. I asked the woman if she could direct us to the Arraial of Formozo, but all the information she could give, was that it was three leagues distant; not only had she never been there, but had never gone half a league beyond the spot where she lived; she told us however, that if we went to the house of the Juiz de Paz of the district, who lived about half a league from Abadia, he would give us all the information we wanted. We proceeded there accordingly, and found his house to be scarcely better than those we had just left, and the Juiz himself, a little meagre old man, with a grey beard that appeared never to have felt a razor. When I asked according to the custom of the country, if he would allow us to pass the middle of the day with him, he said he was sorry he could not give us accommodation, as two travelling merchants from the Rio de San Francisco, occupied the only spare room in his house. As the day was fine, we took up our quarters beneath the shade of a large tree, called Pao Parahiba (*Simaba versicolor*, St. Hil.), which grew before his house. Still wishing to give the horses a feed of Indian corn, I solicited the old man as a favour to sell me a small quantity, but he assured me he had not a single grain in his possession; this however, I scarcely

believed, as I saw heaps of husks lying about, and not long after, one of my men was informed by a slave belonging to the place, that his master had plenty. In the course of the day, having learned my profession, he came to consult me respecting a complaint of the chest, under which he had been labouring for about eight days; but I very coolly told him, that being aware he had plenty of corn, I would not attend to his complaint, until he had sold me as much as would provide a good feed for all my horses. He now confessed he had a little, and would try to spare as much as I wanted; in half an hour he sent out about a bushel, for which I immediately paid him the usual price, about two shillings. I found him labouring under a slight attack of inflammation of the lungs, for which I bled him, and left him some medicine to take. I could not however ascertain his reason for refusing me the corn in the first instance, but my medical knowledge ultimately acted like a charm in procuring it.

When we left the house of the Juiz de Paz in the afternoon, he directed us to Formozo, but as will be seen, not sufficiently clearly. We started early with the intention of making a long stage, and after travelling two very long leagues, we arrived at a small house in a hollow where two men, a negro, and a mulatto, were making Farinha de Mandiocca. From them we learned we were on the wrong road for Formozo; and when I asked leave to pass the night here, they assured me we should find much better accommodation a little way further on. As the hut was small, I accordingly pushed on towards the place indicated, hoping to obtain good shelter, as it had been thundering all the afternoon, and seemed likely soon to

rain; but when we had travelled half an hour without meeting with any signs of a house, we reached a small muddy stream, just as it was getting dusk, in crossing which, one of the horses fell with its load of specimens of dried plants in large skin boxes, by which the plants became soaked; this was all the more vexatious, as some of these parcels were the same that had formerly suffered on the journey from Duro to Natividade. After passing this stream, we went on pretty quickly for about another half hour, when we arrived at a small uninhabited house in a very ruined condition, but as the roof was in great measure entire, we determined to remain here for the night. We were much incensed against the men who gave us such wilfully false information, for just as the luggage was taken off the horses, it began to rain heavily, accompanied by a strong wind, and, notwithstanding that we covered the open patches in the roof and walls as well as we could with skins, it was two hours before we could manage to keep a candle lighted. Towards midnight the storm ceased, when we kindled a large fire in front of the house, which helped to warm and dry us.

On the following day we examined the collections that had been wetted, and as the sun shone brightly, we dried them by spreading them out on the sheets of paper in which they were packed; this task having occupied nearly the whole day, we passed the following night under the same shelter. In the afternoon I took a walk a little way along the banks of a small stream, which flows into a large marsh, lined on each side with Buriti palms, and other trees and shrubs, where I collected a number of fine plants. Next morning before starting, Mr. Walker in searching

for a ring to fasten into the end of one of our trunks, had a very narrow escape from being bitten by a Rattle-snake; the ring had been laid down in a corner of the room, and putting his hand to search for it in the dark, he felt something soft which he was just about to lift, when to his horror he discovered it to be a Rattle-snake; no time was lost in killing this frightful reptile, which was found to measure nearly five feet in length; I had slept all night within two feet of it. We left this place on the morning of the first of June, and after travelling about a league, came in sight of some houses which were supposed to be Formozo, but were informed the place was called Campinhas, and that we had left the former place behind us a little to the westward. Half a league further on, we halted during the middle of the day, in the house of an Indian, at a place called Pasquada; when we arrived, the man was absent working in his plantation, but his wife received us with great hospitality, immediately sending one of her boys with a large basket of oranges and another of sweet potatoes, and a few eggs, treating us in a very different manner from that to which we had been for some time accustomed. From this place we went on about two leagues, and encamped for the night under a large tree, called by the inhabitants Folha larga (*Salvertia convallariodora.* St, Hil.). The nature of the country still continued to be very much the same as that we had traversed since we had reached the table land of the Serra. On the dry grassy flats, I met with a few specimens of the beautiful Amaranthaceous plant which Martius has described under the name of *Gomphrena officinalis,* and which is well known to the people of the country by its vernacular

name of Para-todo. It has a large tuberous root, which is very much used as a purgative, and as its name implies, is considered good for every complaint. The stem is about a foot high, hairy and leafy, and bears at its extremity a large compact head of crimson flowers. We passed a miserably cold night being obliged several times to get out of our hammocks, in order to warm ourselves at the fire. Had we proceeded half a mile further, we should have reached a good-sized Fazenda, but I was not aware we were so near it, until we heard a cock crow in the morning. We halted during the middle of the following day, at a Fazenda called San Francisco, about two leagues distant from where we slept. From the time we left Arrayas, the horses had gradually fallen off in strength, owing to the want of proper provender, as they had depended almost entirely on the coarse rank innutritious grasses of the mountain pastures. They had also been accustomed to a warmer climate than that we now experienced on the table-land of the Serra, where we were exposed to a chilly S.E. wind, which at night was particularly piercing. The heat during the day, especially when unclouded, was very great, and this rendered us much more susceptible to the cold at night. At Riachão I was obliged to exchange two of my horses that could proceed no farther, and finding here that my own horse, which I had constantly ridden since I left Icó, in the province of Ceará, was with difficulty kept from lagging behind the others, it became necessary, much against my inclination, to part with him, and procure another; on leaving him behind me I felt as if parting from an old friend, as we had become so much accustomed to each other; my chesnut

horse was now replaced by another of a pure white, with a flowing mane and tail; but it did not remain long in my possession, for it was stolen from me soon after we crossed the Rio de San Francisco. We left San Francisco in the afternoon and passed on our way to the first house from the Fazenda, which is said to be three leagues distant, but as the leagues in this district were even much longer than those of the more populated parts of Goyaz, the distance in reality was far greater; towards dusk we encamped under some small Tingi trees (*Magonia glabrata*, St. Hil.) from the stems of which we suspended our hammocks. Some of the large undulating grassy Campos through which we passed between the Fazenda and the place of our encampment, had been burned a few weeks before. These were now covered with numerous herbaceous plants in full flower, and I observed that in those parts that remained untouched by the fire, the same plants were in a more backward state, none being yet in blossom; but over the burned tracts, the new grass was springing up vigorously, promising soon to yield an excellent pasture for the cattle. On the following morning, after having proceeded about half a league, we reached the Rio Carynhenha, which forms the boundary line between the province of Pernambuco, through the south west corner of which we had for a few days been passing, and that of Minas Geräes, so that on crossing it, we at length entered the latter province. After travelling a further distance of two leagues we halted to breakfast, under a wide-spreading Piki tree, on the margin of a Buriti swamp. The first part of our day's journey was through an open Campo country, the greater part of which had lately been burned; but the

latter half was through a hilly and thinly wooded tract. The day being cloudy, and the wind blowing freshly from the S.E. made us all complain much of the cold. In the afternoon it was my intention to reach the next house, said to be three leagues from that we had passed in the morning, but after travelling till dark, without seeing it, we encamped for the night near some bushes on the banks of a small river; and as there were no trees here from which to suspend our hammocks, we contented ourselves with sleeping on hides spread on the ground. In passing through a wooded Campo (Taboleira coberta) we came upon a large ant-eater (*Myrmecophaga jubata*) which Mr. Walker followed with the intention of shooting, but his gun missed fire; we all pursued it on foot with sticks, as none of our guns happened to be loaded. I was the first to come up with it, and being well aware of the harmless nature of its mouth, I seized it by its long snout, by which I tried to hold it, when it immediately rose upon its hind legs, and clasping me round the middle with its powerful fore paws, completely brought me to a stand; one of the men now coming up, struck it a blow on the head with a thick stick, which brought it for an instant to the ground. Notwithstanding it was frequently stunned by the blows it received, it always raised itself again and ran off; at last I recollected the small pistols which I always carried in my jacket pocket, loaded with ball, when by the first shot through the breast it fell dead. It was a very large animal, measuring about six feet without including the tail, which together with the long hair by which it is covered, measured full four more. It ran very slowly, owing to the peculiar organization of

its fore feet, two of the claws of which are very large and doubled up when it walks or runs, causing one side of the foot to rest on the ground. The proper, or rather principal use of these powerful claws, is to assist in obtaining the white-ant, the food on which it lives. The large clay nests of these insects are very common in those upland Campos, and when the ant-bear wants a meal, he attacks one of these hillocks with his fore claws, tears out a portion of the side, and pushes in his long slender tongue, which is covered with a viscid saliva, to which myriads of the ants adhere, and opening his little mouth he draws it in; now shutting his lips, pushes it out a second time, retaining the ants in his mouth till the tongue has been completely exserted, when he swallows them. We afterwards met with numbers of these strange looking animals.

The small river near which we slept, was full of rounded blocks of limestone, which being very slippery, rendered our passage across it difficult, but, fortunately all the luggage was got over in safety. We now travelled for a league, through a bare, arid, hilly country, in which almost the only tree that exists, is a small gregarious species of *Vochysia*, and arrived at the house we expected to reach the night before, where I remained all day, in order to preserve the skin of the ant-eater, and to arrange some of my other collections. This place is called Capão da Casca, and consists of but one small miserable hut, entirely formed of leaves of the Buriti palm. It was inhabited by a mulatto, his wife and three children; there were but two very small apartments, so that we were obliged to sleep on our hide beds spread out on the

ground before the house, where our men had kindled a large fire. The house is situated in the mouth of a small wooded valley, and the only cultivated ground I saw, was a plantation of Mandiocca. The miserable poverty of the family seemed to be entirely owing to the laziness of the man, who was a perfect picture of indolence.

We left early on the following morning, with the intention of making a long journey, as the next house was said to be six long leagues distant, which I set down as equivalent to ten legal ones. Shortly after leaving the house, we had to cross a small stream, the bed of which was very boggy, so that one of the horses stuck fast, and in trying to extricate himself fell, together with his load, into the stream. It was some time before the boxes could be taken off, by which time they became quite full of water, fortunately it was not a load of botanical specimens; but one of the boxes contained the last remains of my stock of paper for packing dried plants, as well as a little box full of the skins of bats and other small quadrupeds, together with some insects, all of which were more or less destroyed. As this was the first horse that attempted to pass, I would not allow any of the others to venture across with their loads, all were unpacked and passed over by the men in safety. By the time everything was again put into travelling order, and we had gone on about half a league, it was mid-day, when we halted under a large tree in the hollow near a wooded marsh. Our first care was to dry all the articles that had been wetted in the morning, which operation was much favoured by the sun that shone brilliantly. Some of the Campos we passed through were covered

with a large species of tree-lily, bearing a profusion of beautiful purple flowers. Early in the afternoon we continued our journey, and halted for the night in a wooded Campo, a little above a large Buriti swamp, sleeping on a hard bed, there being no place wherein to sling our hammocks, and suffering much from the cold. Although accustomed daily both to privations and fatigue, there was an indescribable pleasure in the wild life we had long been leading; it is true we were deprived of nearly all the comforts of civilized life, but we were, at the same time, free from all its restraints; when we rose in the morning we knew not where our next sleeping place might be, but the choice was almost always at our command, which, however, was not made at random, but constantly regulated by some indispensable requisites, such as water and grass for the horses, trees from which to suspend our hammocks, and wood, wherewith to make our nightly fire. We had hitherto met with but little difficulty in finding all these together, but the part of the Serra Geral on which we were now travelling called the Serra das Araras, was in most places so destitute of arboreous vegetation, that trees were seldom met with in combination with other requisites for an encampment. On arriving at a place where we wished to remain, each person had his own department to attend to; the first thing was to unload the horses, at which all assisted; Mr. Walker and I always saddled and unsaddled our own animals; two of the men then took them to the spot that offered the best pasture, where they were left, after fastening their fore legs together with leathern straps to prevent them from straying during the night; these men on their

return, brought with them as much dry wood as they could carry. Another man was dispatched with a large leather bag to fetch water; while Mr. Walker and I arranged the packages together in such a manner that they could readily be covered over with skins in the event of rain; two large trunks put together served as our table, while two smaller ones supplied us with seats. Generally before the men returned, Mr. Walker had kindled a fire, and while supper was preparing, which was also our dinner, for we took only two meals a day, I occupied myself in preparing and changing the specimens collected on the previous days. By the time the water was boiled for our tea, the piece of dried beef which had been put on a wooden spit, and suspended over the hot embers, was ready for our supper, as it required to be little more than heated. The tea, dried beef, and farinha de mandiocca constituted our usual fare, and I am certain that if any of our European friends, who had never seen this kind of provision, could have been suddenly transported to one of our meals, he would have concluded from the appearance of our food that we were eating saw-dust, and roasted leather. Our greatest comfort was a large stock of excellent tea, which I laid in before leaving Pernambuco, and which, fortunately, lasted till we reached a more civilized place, where more was procured; this was my only beverage during the whole of this long and protracted journey, and nothing could be more refreshing at the end of a day's ride under a burning sun. I was told when I arrived in Brazil, that I should find it necessary to mix either wine or brandy with the water I drank, but a very short experience taught me, not only that they were unnecessary,

but decidedly hurtful to those whose occupations lead them much into the sun; whoever drinks stimulating liquors, and travels day after day in the sun, will certainly suffer from headache, and in countries where miasmata prevail, will be far more liable to be attacked by the diseases which are there endemic. The dried beef of an ox generally lasted us from three weeks to a month, by the end of which time, it was scarcely fit to be eaten, becoming as hard as a chip of wood; in moist rainy weather, it was very difficult to preserve it, for with the utmost care, we could not prevent the breeding of maggots, from which it required to be freed both before and after it was roasted: we were seldom, however, more than a fortnight without fresh provisions of some kind or other, either in the shape of deer, monkeys, armadillos, large lizards, or birds of various kinds.

We started early from the Buriti swamp where we slept, with the expectation of reaching the Fazenda do Rio Claro about mid-day, but a little before that time we found, by the direction in which we were going, that we had taken a wrong road. A little after mid-day we came to the S.E. termination of that part of the Serra das Araras on which we had been travelling, whence we had an uninterrupted view of the vast plain that stretches to the south and east, studded here and there with a few small lakes. After descending the Serra by an easy path, we rested during the middle of the day beneath some trees, by the side of a little stream of cool water that came rushing down from the Serra, not knowing where we were, nor when we might meet with any one to give us information. We soon found the track again, and tra-

velling through a flat thinly-wooded country, on an indifferent path, for about half an hour, we arrived at a small house, which we found empty; and a little further on we came upon another in the same state. Following the same path for about an hour, we met a black man and a boy, from whom we learned that we should arrive at a Fazenda about half a league further on; we likewise ascertained at the same time, that the road we had chosen was a round of about three and a half leagues to the Fazenda do Rio Claro, but that it was much better than the one usually travelled; this, at least, was some consolation for the error we had committed. It was nearly sunset when we reached a small Fazenda, called San José, where we put up for the night; the house was not only small, but in a wretchedly ruinous condition, and belonged to a mulatto, who did not seem to be very industrious. The Rio Urucuya, which runs directly east from the Serra Geral, and empties itself into the Rio de San Francisco a little below San Romão, passes close to the house, and is even there of considerable width and depth. On this day's journey I collected no new plants, being the only instance of failing to do so in my travels since I left the coast.

Next morning, after receiving proper directions for the Fazenda do Rio Claro, we left San José, and not long after we started, came to a large rivulet which was so deep and muddy, that it became necessary for all the luggage to be carried over by the men, and owing to the difficulties of the fording this occupied about two hours. As the stream is narrow, and the banks high on each side, it would not be difficult, in the course of a day, to form a good wooden bridge over it at a trifling expense, for

plenty of wood exists close by; but this is scarcely to be expected from those who will not give themselves the trouble of erecting a decent house to live in, notwithstanding they are surrounded by an abundance of materials. When all had been passed over, I found it was then too late to go on until we had breakfasted, we, therefore, remained here till the afternoon. While at breakfast, an elderly white woman and her son arrived on the opposite side of the stream, and after having crossed it, they remained during the middle of the day in our encampment. We found this woman, notwithstanding her age, to be lively and active, qualities not common among Brazilian women; I learned from her that she was going to a place at a distance of five days journey, to fulfil a vow she had made to San Antonio, some short time before, when she was suffering from illness. During our stay at this place, we were greatly tormented with Carrapatos. We started early, and shortly before sunset, arrived at last at the Fazenda do Rio Claro, having passed through a flat, thinly wooded country, covered with several large coarse kinds of grass. This Fazenda takes its name from a little stream that flows past it, and falls into the Urucuya, about a league further south; although the house was large and commodious, compared with the generality of others in those parts, the owner, Senhor Manoel Lucas, would not give us accommodation for the night, but sent us to a small open shed in front of the hut of one of his slaves, where we slung our hammocks, after having tied up some hides to keep out a cold wind that blew down from the Serra. The men slept in the open air, on the ground, by the side of a large fire. As

I had a great many plants to pack up, and as it was necessary to get two more large hide trunks made to put them in, we remained four days at Rio Claro for this purpose. During our stay, we found the proprietor to be no less exorbitant than Captain Faustino, of San João, in the extravagant prices he demanded for the dried hides and Indian corn that I bought from him, and equally inhospitable in his demeanour. The whole time we remained here, was spent in the shed before mentioned, where we were roasted by day, and starved with cold by night; we found it so extremely cold in our hammocks, for want of a proper supply of blankets, that we rose several times during the night, in order to warm ourselves by the fire, around which the men slept.

It was on the afternoon of the 12th of June, that we left the inhospitable banks of the Rio Claro, and after a journey of two leagues, arrived at the next Fazenda, called Boquerão, from the owner of which we met with a very different reception from that at the Rio Claro; we were not only accommodated in his own house, but shortly after our arrival, he prepared for us an excellent supper of fresh beef, a luxury we had not enjoyed since we left the Fazenda of San João, near San Domingo. I now regretted very much that I had not delayed my preparations until our arrival at this place, as we should have found everything more comfortably provided. The trees since we descended the Serra, I observed to be very different from those we had there met with, resembling much more, those existing in the Sertão country of Piauhy; they consisted of the Cambaiba (*Caratella çambaiba*, St. Hil.), the Folha larga (*Salvertia convallariodora*, St. Hil.),

two species of arboreous *Bignonia*, with yellow flowers, and the Sicupira (*Commilobium polygalæflorum*, Benth.); there were besides a fine *Gerascanthus*, bearing large panicles of white flowers, a silk-cotton-tree (*Bombax*), and a simple leaved *Rhopala*.

Our host, whose name I regret I have neglected to record, would not allow us to depart on the following morning till we had breakfasted. As our stock of provisions was again becoming short, he sold me as much dried beef as I thought would carry us to San Romão, which was not now many days journey distant. We rested during the heat of the day at the next Fazenda, after travelling two and a half leagues; in the afternoon we went another two leagues, and remained for the night at the Fazenda of Santa Maria. The country still continued flat and dry, partly open, and partly wooded; some of the open places abounded, as far as the eye could reach, with the large yellow clay nests of the white ant, among which we saw several ant-eaters, and a large flock of the ostrich of the country, which, as soon as they saw us, fled with extraordinary rapidity. From Santa Maria, we went on to a little hamlet called Espigão, half a league distant; it consisted of a few small houses, at one of which we stopped to make enquiries about the road; it belonged to a tailor, who was at work outside the door; as soon as we arrived, about half a dozen young women, of all colours, and dirty in the extreme, came out to reconnoitre us. Following the directions, we went on about a league further, and halted to breakfast at an old uninhabited house, by the side of a beautiful stream of clear water, flowing from a Buriti palm swamp. Resuming our journey in the after-

noon, we crossed the stream, but were puzzled which road to take of the two that presented themselves, one led to the south, and another to the east; and as our general direction was easterly, we followed that course. After travelling about two and a half leagues through a very arid and barren country, consisting of long flat sandy tracts, wooded with a few stunted trees and bushes, and large open Buriti swamps, we arrived at another uninhabited house. During the latter part of this journey, the road inclined so much towards the north, that I felt certain we had not taken the right one, and determined to retrace our steps on the following morning, and take that which led to the south. As the house was in a very ruinous state, we slept under some trees; and as the nights had now become too cold for the use of hammocks, we generally abandoned them, and adopted instead, an ox-hide laid on the ground, by the side of a large fire, with a trunk placed at our heads, and two or three others alongside; a heap of wood was always collected and laid within reach, and as the hardness of our beds never allowed us to sleep too soundly, the fire was always well kept up; the men had another fire to themselves.

On the following morning we returned to the place where the two roads separated, and breakfasted under the shade of a large Sicupira tree; fortunately, just as we were about to start, the same old lady and her son whom we met at the Fazenda do Rio Claro, now passed us, on her return from the fulfilment of her vow; from her we learned that we were altogether out of our proper course, and that to regain it, it was necessary to return to Espigão, at which place there were also two roads, and

that we had been directed to the wrong one; we had, therefore, no alternative but again to retrace our steps, having lost a day and a half by this erroneous information. On reaching Espigão, we took the other road without making any further enquiries, and after travelling about a league and a half, reached the banks of a small river, half an hour after sunset. We passed the night under some trees on the banks of the stream, which is called the Ribeirão de Area; it is only about twenty yards broad, and shallow enough to allow the horses to pass over with their loads, but as the bottom was very bad, from the great quantity of smooth rounded stones, I thought it safer to have all the luggage conveyed over next morning in a fine large canoe, which we found made fast on the opposite side, by which means, we escaped all risk of damage from the slipping of the horses' feet. The country around this place was very pretty, being flat on each side of the river to a considerable distance, well covered with grass, and thinly wooded; immediately above the ford, there is a long rapid, the rushing of the water over which, is heard at a great distance. The canoe being large, we were not long in passing the luggage, and afterwards we made a journey of about two leagues and a half, through a slightly undulating, arid and barren country, consisting chiefly of bare grassy hills, covered in many places, with abundance of ferruginous stones, and flat, sandy, thinly wooded Taboleiras. We rested by the side of a small stream which flowed from a Buriti swamp, and as there were no large trees, we sheltered ourselves from the burning sun among some bushes which grew on the margin of the rivulet. In the

afternoon, another journey of two leagues and a half through a similar country, brought us to a little Fazenda called Taboca, which belonged to a mulatto. On starting next morning, the owner accompanied us for nearly half a mile, in order to put us upon the right road, there being several other paths leading to different places.

A journey of about ten leagues from this place, which occupied two days and a half, brought us to the banks of the Rio Urucuya, at a place called San Miguel, little more than a league to the westward of its junction with the Rio de Francisco, and here we had to cross it; the stream was about a gunshot in breadth, and very deep. As there was no regular ferry established here, we hired a small canoe, by means of which all the packages were safely taken across in two hours. The horses were passed about a quarter of a mile further up, at a place where they had only about half the breadth of the river to swim. It was in the morning that we arrived at this place, and although no corn could be obtained for the horses, I determined to remain here till the following day, in order to give them a rest, all being in a very exhausted state, in consequence of their long journey, and the want of nourishing provender. We were now only five leagues from the Villa de San Romão, and were the more anxious to reach it as soon as possible, as our stock of provisions had been exhausted the evening before we reached the ferry. The journey from Boquerão occupied a longer time than we anticipated, and we were disappointed on finding, that after leaving that place, we could obtain nothing by purchase at the few small Fazendas we passed. I have everywhere, observed during my travels in Brazil,

and the same remark has been made by M. Auguste de St. Hilaire, that the nearer a traveller comes to a town, or village, the less chance he finds of being able to renew his stock of provisions. The men had still a few french-beans, and a small piece of fat bacon left, but not more than would suffice them for a single meal; Mr. Walker and I had now been two days and a half without tasting any solid food, sustaining ourselves during that time entirely on strong tea, for we had not been able to meet with a single wild animal of any description; we had often before suffered severely from thirst, but had never been so long without food; it was fortunate we had the tea, as it prevented us from suffering nearly as much from hunger, as I expected we should have done. We stopped at a house on the south side of the river, which was both miserable and small, belonging to an old black woman, the only resident there; she had nothing, not even a fowl to sell. We slept in a part of the house that wanted a roof, and had only a small portion of the walls entire; a large fire was kindled in the middle of the floor, by the side of which we spread out hides for our beds.

As there was some difficulty in finding one of the horses, it was late next morning before we left the banks of the Urucuya. After travelling nearly a league, we halted for some time, at a place where there are two small lakes, called As Duas Irmãas. We did not proceed further, having been informed, before we started, that we should not meet with a drop of water for the next three leagues, and this in the afternoon we found to be really the case, the road leading through one continued flat dry sandy plain, thinly covered with bushes and small trees. We reached

the first watering place a little before sunset, it is called Riacho, and is about a league from San Romão; there is no house there, nor could I observe any appearance of habitation on the whole road from the Urucuya to the Villa; we hoped to have reached the Villa that evening, but the horses were too much fatigued to go further; we therefore encamped for the night under some trees by the side of a limpid rivulet; none of us had had a morsel to eat, but we had all a large basin of strong warm tea, which made up in some measure for the want of a more substantial supper. To this Mr. Walker and the men added a pipe of tobacco, as they were all inveterate smokers.

At length, on Sunday morning the 21st of June, we entered the Villa de San Romão, and having proceeded to the house of the Juiz de Paz, in order to show him my passport, he very kindly sent a person to look after a house for our reception. He was not long in finding one, and as soon as the horses were unloaded, I dispatched a man in search of provisions, but, strange to say, he could find nothing but farinha. A market had been held early in the morning, of both fresh and dried beef, but all had been sold off before our arrival; a most fortunate occurrence, however, afforded us a better breakfast than we anticipated. Just as we were preparing some tea, which we intended to take with some farinha, a little boy came to enquire if I would buy a fish which he had just caught, and which was lying on the banks of the river. I went there immediately, and for the value of a few pence, bought the fish, a fine species of salmon upwards of two feet long, which I need not say was soon cooked, and formed a most welcome meal for all of us.

The Villa Resonha de San Romão is situated on the south bank of the Rio de San Francisco, in the district of Paracatú; it is small, not containing above one thousand inhabitants, and forms a square of several long narrow irregular streets; the houses are all of one story, and without exception, built of wicker-work and clay, there being no stone in the neighbourhood; the principal streets run parallel with the river, and the three which are nearest to it, are almost every year inundated by the overflowing of its waters during the seasons of the rains. The other part of the town being somewhat higher, is exempt from this annoyance; the house we inhabited was one of these exposed to those floods, and although the floor, was at least four feet above the level of the street, it required to be abandoned annually for some time; during the great flood of 1838, to which I was witness on my voyage up the Rio de San Francisco, the water rose five feet above the level of the floor, and the walls still retained evident marks of the fact. The population consists chiefly of people of colour, and I do not believe that a dozen white families exist in the whole Villa. Most of the respectable inhabitants, are shopkeepers who supply the Fazendeiros, and those who reside in the surrounding country, with European and other goods. The place cannot be said to have any trade of its own, the principal source of traffic being fish, caught in the river, which after being salted and dried, is sold to the inhabitants of the Sertoes, who are remarkably fond of this food. The better class of the inhabitants are greatly addicted to gambling, resorting every day for that purpose, to the house of an old Captain, who is the owner of a spirit

shop; having occasion to call several times on some of them, with letters of recommendation that I brought from Goyaz, I seldom found them at home, being always directed to the above house, where they were sure to be found, in company with one of the two priests belonging to the place, and this on Sundays, no less than on other days. This priest, Padre Francisco Fernandes Vianna, although a man of a most benevolent disposition, was far from being a model of morality to his flock; to him, however, I was indebted for several acts of kindness, as also to Lieut. Col. Thomaz de Conceição, a person of considerable intelligence, who forms an exception to the general character I have given of the inhabitants. From this gentleman I received letters of recommendation to the excellent and learned Padre Antonio Nogueira Duarte, of Contendas, a small village between the Rio de San Francisco and the Diamond district, a person who is spoken of in the highest terms, both by St. Hilaire and by Spix and Martius. I expected to pass through this village, and to have had the pleasure of meeting with one, who though now a very old man, still takes a delight in the pursuits of natural history, but when I found that in order to visit him, I should be obliged to make a round of several leagues, I renounced all idea of doing so, both on account of the fatigued condition of my horses, and of the great desire I now had to reach a place where my funds, which were in a very reduced state, could be renovated. The first evening, as I walked through the town, I was surprised to hear one or more fiddles playing in almost every house; this is the instrument almost exclusively used by the barbers in Rio de Janeiro, and the other

large cities and towns along the coast, but in the interior it is very seldom met with, the guitar being a greater favourite, and generally used both by ladies and gentlemen. In San Romão, however, this usual fashion is departed from, no young ladies' education being considered complete unless she has learned to handle the bow.

It being now the dry season, the river was many feet below its banks, and although of great breadth, appeared narrow when compared with what it was when I first beheld it, in 1838. It abounds in fish, which at this season are brought in canoes in great plenty, and sold in the Villa at a very cheap rate. During my residence there, I prepared specimens of most of the ordinary kinds, which are now in the British Museum. The following are the names of a few of those which are most esteemed.

1. *Surubím**.—This fish, which is a species of sturgeon, often reaches the length of six feet. It is taken most commonly in nets, but sometimes also, especially by the Indians, by being shot at with an arrow, to which a strong cord is attached. The flesh of this species dried, is that principally sold in the Sertão; I have frequently tasted it, and found it excellent.
2. *Curumatám.*—This, as well as the three following, belongs to the *Salmonidæ*; it is about two feet in length, and both in colour and taste its flesh has a very near approach to our common salmon. It inhabits the bottom of the river, and is generally

* This spelling is different from that made use of by St. Hilaire, his being, *Suruby*. That which I adopt for this, as well as for the other species, is taken from a MSS list given me by Padre Francisco Fernandes Vianna, of San Romao.

taken with a drag-net, but never with the hook. During my stay in San Romão, several canoes came in every morning, nearly full of them, and sold at about a half-penny each fish. The stomach is very thick and muscular, but in all those I examined, I never found anything but a large quantity of fine earth, in hard lumps.

3. *Dourádo.*—A beautiful fish, from two to four feet in length; it is generally taken with the hook, but is not considered delicate food. We, nevertheless, relished the first we ate very much, it being this species I bought of the boy on the day we arrived at San Romão.
4. *Matrixám.*—Somewhat similar to the *Dourádo,* but smaller, and considered a much superior fish.
5. *Piau branco.*—From one to two feet long, and with much larger scales than any of the others; it is taken with the hook, and its flesh is much esteemed.
6. *Curvínha.*—About two feet in length, with a scaly head; it takes the bait readily, but the flesh, which is soft, is not considered good.
7. *Traíra.*—Also about two feet long and rather slender; it takes the bait, and is much esteemed.
8. *Pirá.*—About two and a half feet long, with a protruded beak; is only taken with the drag-net, and is considered a delicate fish.
9. *Mandí.*—One of the *Siluridæ,* and perhaps a species of *Mystus*; from a foot and a half to two feet long, with no apparent scales, and long barbecels proceeding backwards from its mouth. It keeps

near the bottom of the river, is taken by the hook, and considered one of the best fish it produces.

10. *Pocomó.*—This and the following, also belong to the *Siluridæ*, and are perhaps, species of the genus *Hypostomus*. The *Pocomó* is an ugly black fish, about two feet long, covered with large hard plates. It keeps near the bottom, and is taken in great plenty in the nets which are thrown for other fish. During my visit, the sandy shores of the river were covered with those which had been thrown out of the nets. It is seldom eaten, but makes good bait for other fish.

11. *Cascuda.* This species is smaller than the last, and very much resembles it, except that it is of a yellow colour.

The *Piráuha*, and *Piába*, of both of which I have already spoken, are as abundant here as they are below the falls of Paulo Affonso; besides these, there must be many others which I had not an opportunity of seeing. During the whole time we remained in San Romão, we lived, principally on fish; indeed, it is so abundant, and so cheap, that fresh beef is rarely offered in the market. The navigation of the river being uninterrupted from this place to the falls of Paulo Affonso, many canoes are continually passing up and down; their principal cargo up is salt, from the manufactories which exist on the vast saline flats on both sides of the river below Porto do Salgado; this is partly sold for money, and partly exchanged for hides, tobacco, &c.

As it was essentially requisite to arrange and pack the large collections made during our journey from Arrayas,

and as our long journey now began to manifest its effect on the men, as well as on the animals, I determined to give them a sufficient rest, by remaining a fortnight at San Romão; accordingly the horses were sent to pasture on a large island in the river, immediately opposite the town; this island is about half a league long, and a quarter of a mile broad; the pasture there was not very good, but the horses remained much safer than in any other place. Horse stealing is so very common in this quarter, that scarcely a troop arrives, from any distance, that does not lose one or more animals; before our arrival, we became aware of this fact, and were advised to put our troop on the island for safety. As the country was greatly dried up around the town, by the effects of the long drought; I did not here add much to my collections; and, indeed, a slight accident that occurred to me, prevented my walking about so much as I should otherwise have done. A few days after we arrived, I went to pay a visit to a gentleman, when in going up a few steps at the door, my foot slipped, and my leg came with considerable violence against the sharp edge of one of the brick steps; the wound, although small, troubled me greatly, for owing to the fatigue I had previously undergone, and the innutritious nature of our food, my body had evidently fallen into a somewhat scorbutic state. I did not finally recover from the effects of this accident till nearly two months afterwards, when I rested several weeks in the house of a kind friend in the Gold district.

CHAPTER XII.

SAN ROMAO TO THE DIAMOND DISTRICT.

Leaves San Romao—Passes Guaribas—Passagem—Geräes Velhas—Espigao—Caisára—Cabeceira—Arrives at the Villa de Formigas—Town described—Account of the impostor Douville—Country around rich in Botanical products—Passes Viados—Arrives at the Arraial de Bomfim—Reaches San Elo—Sitio—Comes to a Gold Working called Lavrinha—Crosses the River Inhacica—Reaches As Vargems—Registo do Rio Inhahy—Bassoras on the river Jiquitinhonha—examines a Diamond Mine—Formation in which the Diamond is found—Mode of working it—Arrives at the Arraial de Mendanha—Town described—Ascends the Serra de Mendanha—Reaches Duas Pontes—Arrives at the Cidade Diamantina, formerly the Arraial de Tejuco, the Capital of the Diamond District—Town situated on side of Hill—Description of its Population—Their mode of Dress—its cold Temperature—Productions of its Neighbourhood—Mining for Diamonds, formerly a privileged Monopoly, now is open to all—Character of Miners—Extent of Diamond Mines—Privilege of Slaves there employed—Climate very Healthy—Women very Handsome—Complaints incident to its Climate—Loyalty shown by its Inhabitants—Fatality among Horses.

The province of Minas Geräes is not only one of the largest in Brazil, but one of the richest, its natural resources being very considerable. It extends between the 14th and 23rd degrees of south latitude, and between the 41st and 53rd degrees of west longitude, the four more westerly degrees, however, include but a very narrow corner; on the east it is bounded by the maritime pro-

vince of Espirito Santo, on the north, by those of Bahia and Pernambuco, on the south, by those of Rio de Janeiro and San Paulo, and on the west, by that of Goyaz. It is naturally divided into two very unequal portions by a mountain chain, that runs from south to north, in which exist the Gold and Diamond mines, for which the province is so celebrated. The country to the east is mostly covered with virgin forests, while that to the west, which is flatter, chiefly consists of pasture lands, much of which, however, is covered with Catinga forests, forming one of the largest tracts in Brazil, to which the name of Sertão is given. In order to reach the Cidade Diamantina, the capital of the Diamond district, which it was now my intention to visit, it was necessary to make a long journey through this desert-like country; the road most frequented, is that which runs southward along the east bank of the Rio de San Francisco, and the north of the Rio das Velhas, a large tributary of the former, which takes its rise in the Gold country; the other, which is a far worse road, leads through the Sertão in a south-east direction; but I preferred it, because it would sooner bring me into the mountainous regions of the Diamond district.

On the 1st of July, preparatory to our departure, my horses were brought over from the island to the east side of the San Francisco, and early on the following morning the luggage was all at once passed over, in a large ajojo, two canoes lashed together. All being now prepared, I had resolved to proceed immediately, but on collecting the animals, my own saddle horse was not to be found; all that day was spent in search of it, but the only trace left, was the leathern strap, by which its fore legs had

been secured, and which was found in the wood unbottoned at both ends, and as this could only have been done by some person, we came to the conclusion that the horse was stolen; I, therefore, resolved to lose no more time in looking after it. About mid-night we were awakened by a black man, who had assisted my men in the morning's search, who came to inform me that a horse similar to mine, had been seen during the day, tied to a tree, in the wood, considerably further up the river; early next morning, I despatched one of my people in that direction to look for it, who returned in about an hour, bringing the horse with him; it was evident it had been taken there, in the hope of its remaining concealed, until an opportunity occurred of carrying it away altogether; I now lost no time in commencing the journey, and making a short stage of about a league, rested, during the middle of the day, at a Fazenda called Guaribas. The first half league was through a flat thinly-wooded tract, which is generally overflowed by the river, during the rainy season; I saw some fine large trees in this wood, of a species of *Triplaris*, and an arboreous *Bignonia*, destitute of leaves, but covered with flowers not unlike those of the Fox glove, in shape, size, and colour; the underwood here, consisted chiefly of different kinds of *Mimosa*, *Acacia*, *Bauhinia*, *Cæsalpinia*, &c.; and an immense number of Lemon trees, loaded with fruit; this tree has here become quite naturalized, and the cattle that pasture in the woods are so fond of the fallen fruit, that when killed, their flesh smells strongly of Lemon. The other half league led through a thickly wooded Taboleira. At Guaribas, I occupied myself with skinning a very large

howling Monkey, which Mr. Walker shot, the evening before, on a tree on the banks of the Rio de San Francisco; and in the afternoon we advanced another two leagues, and arrived at a Fazenda, called Passagem. The road was dreadfully bad, in consequence of the underwood which choaked the almost untrodden path; on this journey, every little twig and blade of grass was loaded with Carrapatos, in balls, often the size of filberts, and we became completely covered with these annoying insects; the banks of the little stream near the house, in particular, was swarming with them. In the afternoon, we passed two small lakes which were full of wild ducks, but we were too much annoyed by the badness of the road, to lose time in shooting any of them, although they appeared to be very tame; they are smaller than those which frequent the lakes of the north of Brazil.

The Fazenda of Passagem, at which we stopped, belongs to a person who resides in San Romão, whose acquaintance I made during my stay there; the Vaqueiro in charge of it, had orders not only to entertain us for the night, but to guide us to the next Fazenda, which is three leagues distant. It was my design to leave early on the following morning, but my mortification was extreme, on finding that my riding horse again was not forthcoming with the others; as the country around the house was covered with a thick Catinga forest, abounding in many places with a small kind of Bamboo, of the leaves of which the horses are remarkably fond, we concluded he would be found grazing somewhere near at hand, but all the forenoon was in vain spent in search of him; the Vaqueiro, who was a most obliging man, and well ac-

quainted with the country, then mounted his horse, in quest of the lost animal, but he returned in the evening, without having been able to find the slightest trace of him; all the following day was again spent in a useless search, and, as the pasturage at this place was very bad, we went on in the evening, for the sake of the other animals, to Geräes Velhas, the Fazenda to which the Vaqueiro had orders to conduct us; he remained here with us all night, and next morning, I sent one of my men back with him, to have a last search for the missing horse, being unwilling to proceed without him, as he was one of the best belonging to my troop; but on the following day, the man returned without having obtained the slightest intelligence of the lost animal; I entertained no doubt, that the thief who had been disappointed on the former occasion, had now followed us, and at last made sure of his booty. The country between Passagem and Geräes Velhas consists principally of a flat Taboleira, which for the most part, is covered with a tall grass, a species of *Andropogon*, from six to twelve feet high. For the next four days after leaving Geräes Velhas, our route was through a very thinly inhabited country, consisting sometimes of low Catinga forests, at others, of Taboleiras cobertas, and not unfrequently of woodless grassy hills, on which that species of *Callopisma*, called Boca do Sapo, and the beautiful *Chresta pycnocephala*, grew profusely, both of which were then in full flower. In passing through bushy grassy tracts in the Sertão, the ears of the traveller are greeted, from early dawn till night, by the loud cries of a large gallinaceous bird, called by the inhabitants, Seriema; they generally go in pairs, and by

keeping among the long grass, they are seldom seen; like the Ostrich of the country (Emu), they run with great quickness. St. Hilaire compares their cry to that of the turkey, but I find in my journal, that I have frequently remarked it to be like the yelping of a whelp; they build their nest in the low trees, and lay two eggs; as their flesh is not much esteemed, they are seldom sought after by the sportsman; and on this account, are frequently heard uttering their peculiar cry in the immediate neighbourhood of houses: it is the *Dicolophus cristatus* of Illiger.

In passing through a little hamlet, called Espigão, which consists of about a dozen scattered houses, belonging to people of colour, I met with a horse dealer, with whom I exchanged two of my horses, that were a good deal exhausted, for two better ones, giving him a sum of money to boot; but as he saw I was almost driven by necessity to make this exchange, he, of course, contrived to have the best of the bargain, in which respect the Brazilian horse-dealers very much resemble those of more civilized countries. On leaving Espigão, we travelled all the afternoon, and the whole of the next day, before we came to any habitation; it was dusk when we arrived in sight of it, and it was not without some difficulty, owing to the badness of the road, and our not knowing which path to take, that we at length reached this Fazenda, called Caisára. I was much disappointed to find this portion of the province so thinly populated, and exhibiting but few indications of native industry; although many tracts appeared, equally well adapted for the rearing of cattle, as the greater portion of Goyaz, we saw scarcely any animals

distributed over its surface; there seemed abundance of excellent pasturage and good shelter for cattle, and notwithstanding that the upper parts of the hills were sometimes bare, the valleys appeared to be well wooded. When I asked for quarters for the night, at this place, I was told by the owner, an old mulato, that if we chose, we might sleep under some orange trees, to which he pointed, at a little distance from the house. Thither, we accordingly went, but just as we were getting the horses unloaded, he came down to inform us, that although he gave us liberty to sleep there, he would not on any account allow us to make a fire. The nights in this part of the country being too cold to admit of sleeping in the open air without artificial warmth, I determined to keep aloof from a man who was so uncivil and inhospitable, and therefore moved away from his orange trees, carrying off all our equipage to the high road, which passed by the house, where we kindled a large fire, by the side of which we slept, but most uncomfortably, as the ground was covered with Carrapatos. Next morning before we started, the owner of the Fazenda came out to visit us, and no doubt, being ashamed of his conduct, he begged I would not mention to any one the manner in which we had been received, which was entirely owing to the smallness of his accommodation, but this was evidently a mere excuse, as his house was by no means small. The true reason for making this apology, was his having ascertained, from one of my men, the nature of my profession, for he brought with him one of his daughters, to solicit my advice respecting a complaint under which she had laboured for some time; I was also asked by him to visit one of his slaves, who for many years, had

been prevented from working, by a complaint not uncommon in Brazil, Sarcocele; this however was the most remarkable case I had ever witnessed, exhibiting an enormous mass of solid flesh in a pyriform shape, that reached the ground, weighing nearly as much as the rest of his body. The wretched being who was thus affected, was a man still in the prime of life, and suffered but little, except from the inconvenience it caused him.

On the afternoon of the following day, we arrived at another Fazenda called Cabeceira, the distance between the two places being about four leagues and a half. On this journey, the country still continued to rise, and about half a league before reaching this place, we passed over a bare Serra of considerable height, the ascent of which was rather steep, although the road over it is excellent, being so constructed that carts can cross it without difficulty; that portion of the mountain in which the road has been made, is a soft brownish coloured clay slate, but at no little distance on each side, the more lofty summits of the Serra consist of a black compact limestone. The bushy Campos through which we passed in the afternoon, were beautifully adorned with a fine plant, belonging to the natural order *Compositæ*, which grew in the greatest abundance, and reached to the height of about five feet, the *Chresta sphærocephala* of De Candolle; it has large leaves, which together with the stem and branches, are covered with a white woolly substance, and is much branched at the top, each branchlet being terminated by a large globose compact head of purple flowers. As there was a good watering place in a wood a little beyond Cabeceira, we preferred going there, rather than remaining

at the house, to which we were invited by the owner. During the whole interval since we had left the province of Goyaz, we never suffered for want of water as we had done in the dry provinces of the north. In every part of the country through which we were now travelling, we found in nearly every valley, a little stream of clear, cool, and delicious water, and during our future progress, it became even more abundant. We were now only two leagues and a half distant from the Villa de Formigas, but owing to the badness of the roads, we did not reach it till nearly one in the afternoon, notwithstanding we left our encampment at an early hour. The country was rather hilly, and the roads stony, but it presented one great advantage to the traveller, which I knew well how to appreciate, in the bridges which are here to be found crossing all the little streams that intersect the roads. They are constructed of wood, and however rude, they save the traveller much trouble, and prevent the risk of damage to the luggage, as we too often experienced on our journey between Arrayas and San Romão, Immediately on entering the Villa, we passed over an excellent bridge of considerable span, one of the best I had yet seen in the interior, it crossed a small river which passes through a portion of the town. Having letters of recommendation to the Vigario of the district, Padre Antonio Gonsalves Chaves, I proceeded at once to his house, where we met with a most hospitable reception; an excellent breakfast was immediately prepared, and good quarters provided us, in an empty house belonging to him, adjoining the one which he inhabited.

The Villa of Montes Claros de Formigas, is of small

dimensions containing a population of about 1,000 souls, but in respect to its situation, the arrangement of its streets, and the neat and clean appearance of the houses, it far exceeded any Villa I had seen in the interior. It is distant from Rio de Janeiro and Bahia upwards of two hundred leagues, and about fifty from the Cidade Diamantina; until the year 1832, it ranked only as an Arraial, but in that year it was elevated to the dignity of a Villa, and is now the chief town of the Comarca of the same name. The site on which it is built has been well chosen, being a slightly elevated plateau, in the centre of a large valley, which is surrounded on all sides, by an irregular ridge of hills of considerable elevation. The greater part of the houses are arranged in the form of a very large square, much longer than broad, of which the south side is still incomplete. At the north end of this square stands the only church the Villa contains, near which is an excellent roofed market-place, for the sale of provisions brought from the country; at the south end of the space fronting the church, is a large jail not yet finished. The small river that passes it, called the Rio Vieira, falls into the Rio das Velhas, yielding the town a very good supply of fish, similar to those found in the Rio de San Francisco. The Villa contains a few shops, where European goods are sold; these goods were formely brought from Bahia, but Rio de Janeiro seems now to be the principal resort of the merchants, who take with them in exchange to the coast, its chief produce, saltpetre, which is found not only in the soil in certain parts of the surrounding Sertão country, but in caverns in the limestone rocks, of which the low mountains in the vicinity are principally formed.

The Fazendeiros in the country around Formigas, occupy themselves principally in the rearing of cattle and horses, which are for the most part driven to the Bahia market. They also cultivate a little mandiocca and Indian corn, but no rice, the dry nature of the country not being suited to its growth.

I remained only two days in Formigas, being now very anxious to reach the Gold country, where I expected to find letters from England awaiting my arrival; I should otherwise have made a longer stay here, in order to recover from the effects of the bruise I received on my leg, at San Romão, which, in consequence of my being obliged to ride every day on horseback, had become so greatly inflamed and swollen, as to cause me much pain and inconvenience, and totally to prevent all chance of making any exursions on foot in the neighbourhood of the Villa. During my stay, I received many kind attentions from the Vigario, who readily afforded me the use of his library, which, though small, contained a good selection of Latin, French, and Portuguese works. From him I received the following information respecting the unfortunate impostor Douville, the author of the pretended travels in the interior of Africa.*

In the year 1836, he visited Formigas, and lived for some time in the house of the Vigario, passing himself off as Dr. Douville, and gaining much money by the practice of medicine; he also trafficked in the buying and selling of horses, notwithstanding that he said he

* For an exposition of the impostures of this pseudo-African traveller, compared with whom Mendez Pinto was but a mere type, see the 10th. and 11th. vols. of the "Foreign Quarterly Review".

was sent to Brazil by the king of France, on a mission to investigate its natural productions, and curiosities, and to construct a map of such portions of the Empire, as he chose to visit during his travels. He boasted much of his African journeys, exhibiting everywhere a gold medal, which he said he received from the Geographical Society of Paris, subsequent to the publication of his work. The Vigario, as well as other persons of intelligence in Formigas, suspected him to be an impostor, concluding that he was not the real Douville, who was said to have travelled in Africa, but another person who had got fraudulent possession of his papers, &c. He generally charged exorbitant sums of money to those he attended in his medical capacity, and it was owing to an instance of this kind, that he met with his death. Somewhere near the Rio de San Francisco, he was called upon to attend a Fazendeiro who was ill, and with whom he bargained to effect his cure, for the sum of 200 mil reis, about twenty-five pounds sterling, but in the end the patient died, notwithstanding which, he insisted on receiving the stipulated sum, and after some time, the heirs of the deceased yielding to his importunities, gave it to him. They did not, however, intend it should remain long in his hands, for when Douville embarked to go down the river, they sent a man after him, who killed him one night as he was asleep in his canoe, and robbed him not only of the 200 mil reis, but of every thing he had in his possession; thus he fell at last, a victim to his own gross impostures.

We left Formigas on the morning of the 13th of July, and after travelling about half a league we reached the

mountain range, by which the valley is bounded, its structure being a dark compact primitive limestone. The ascent which is very gradual, is well wooded with small trees, but on reaching the top, we entered upon an undulating open barren country, with only here and there a few clusters of trees in hollow places; to these isolated woods, the name of Capoes is given, an appellation which is highly poetical, being derived from the Indian word Caapoám, which signifies an island. These island-woods form a peculiar feature, in the upland, open, undulating Campos of the province of Minas Geräes. The trees which compose them, chiefly consist of different species of *Myrcia, Eugenia, Vochysia, Anona, Laurus, Styrax*, &c., intermingled with climbing shrubs, such as *Bauhinia, Paullinia*, &c. The soil in which these trees grow, is often so swampy, that it is difficult to get among them, nor can this be done without risk, on account of the large Boa Constrictors, which frequent these places. After a journey of about three leagues, through this description of country, we came to a small stream in a hollow, where we determined to halt for the remainder of the day, as we had been told the next watering place was about three leagues further on. The spot we selected for our quarters was under the shade of some small trees, but we had scarcely unloaded one horse, when we found ourselves covered with Carrapatos, and on examination, discovered that both the grass and ground were swarming with them. No time was lost in abandoning this spot, and ascending again to the open Campo, we obtained shelter under the wide spreading boughs of a large Jatobá tree. In the grassy fields I found a pretty little melas-

tomaceous shrub with rose-coloured flowers, and on the slanting face of a hill which led down to one of the island-woods, I collected no less than five species of the genus *Eryngium*. During the night, a cold wind blew over the table-land where we slept, from the effects of which, we endeavoured to protect ourselves, by means of a large fire that we kept burning, but which we had some difficulty in maintaining for want of dry wood. Towards morning, we were all aroused by the barking of our large mastiff dog, and the screaming of some one he had attacked. Our encampment was close by the side of the public road, and the dog had sprung upon a poor black man, who was on his way to Formigas, from the Diamond districts, and who had set out on his journey at this early hour, to escape the heat of the day.

On the following morning we went on to the next watering place, which was a spring in a wooded hollow. The country through which we passed, was very different from that we had traversed on the previous day; the first half of the three leagues, was through an elevated, but rather thickly wooded country, on leaving which we ascended a low Serra, covered with a stunted shrubby vegetation; to these elevated shrubby tracts, the inhabitants of Minas Geräes give the name of Carrascos.*

* I shall here briefly enumerate the different kinds of forests and woods, which the inhabitants of Brazil distinguish by particular names. These are first, the Matos Virgens, or virgin forests, such as those which exist on the Organ Mountains, and indeed along the whole maritime Cordillera. To these also belong the Capoes of the Campo countries. Next to the virgin forests come the Catingas, the trees of which are generally small and deciduous, and form the connecting link between the virgin forests and the Carrascos, which grow on more elevated tracts than the Catingas, and consist of close growing shrubs about three or four feet high. These are all natural woods, very different from the

Many of the shrubs seen here, belonged to forms that were quite new to me; one of the most remarkable of these, was a fine new species of the curious genus *Lychnophora*, belonging to the natural order *Compositæ*, and is peculiar to the mountains of Minas Geräes, and, which, together with the Vellozias, give a decided feature to their otherwise peculiar vegetation; this shrub is about six feet high, with numerous branches issuing nearly horizontally from the upper part of the stem, each bearing a cluster of narrow leaves, about half a foot long. The whole of the plant, with the exception of the upper sides of the leaves, is everywhere covered with a dense coat of long brownish coloured wool, which, in places where it grows abundantly, is collected by the inhabitants to fill their beds and pillows. I afterwards met with some other species, having their leaves so very narrow, that at first sight, they resemble the Scotch fir, the likeness being increased by their habit of growth, which is somewhat similar. In the afternoon we made a journey of three more leagues, through a hilly, barren, grassy country, and halted for the night in a hollow, by the side of a small stream, a little beyond a Fazenda, called Viados.

After travelling about a league on the following morning, through a flattish country, we arrived at the Arraial de Bom Fim, an irregularly built village, consisting of a church, and about forty or fifty houses, many of which

next I shall mention, to which the name of Capoeira is given; such wooded tracts are formed by the small trees and shrubs, which spring up in lands that have been cultivated or prepared for cultivation, by destroying the virgin forests, which is generally effected by setting fire to them; the trees that then spring up are always very distinct from those which constituted their original vegetation.

have a very dilapidated appearance; we stopped here no longer than was necessary to give a feed of corn to the horses, of which they stood greatly in need, the pastures through which we now were passing, affording very little nourishment. The principal shop in the village of Bom Fim, belonged, as it did twenty years before, when it was visited by M. Auguste de St. Hilaire, to Colonel Pedro José Virciani, the proprietor of a large Fazenda about two leagues distant, where he resides, the shop being entrusted to a person in whom he confides; this practice I found to be not uncommon with rich Fazendeiros in this province. From the Vigario of Formigas I obtained a line of route from this place to the Cidade Diamantina, but being here informed of another road having the double recommendation of being both better and shorter, I determined on giving it the preference; by so doing, it became necessary to pass the Fazenda of San Eloi belonging to the above mentioned Colonel Virciani. On arriving there, I sent one of my men to ask leave to remain till the following day, which was granted; but on learning that I was a foreigner, he immediately ordered two good rooms to be prepared for me and my men, in a house adjoining that in which he resides. On being introduced to him, I found him to be an elderly man, of hale appearance and of very pleasing manners; I passed the evening very agreably in his house, when he informed me that M. Auguste de St. Hilaire remained a day and night with him during the course of his journey to the Rio de San Francisco. Although he made no mention to me of the circumstance, I afterwards learned that some observations made by that learned traveller and

botanist, in the account of his visit to San Eloi, had much offended this worthy man. The obnoxious passage was the following:— "Pendant tout le temps que je passai chez le capitaine (for he was then only a captain) Virciani, la mâitresse de la maison ne se montra point; cependant, tandis que nous mangions, je voyais un minois féminin s'avancer doucement á travers la porte entr'ouverte; mais aussitot que je jetais les yeux de ce côté, la dame disparaissait. C'est par une curiosité semblable que les femmes cherchent à se dedommager du peu de liberté dont on les laisse jouir."*

The same lady was still alive, and I saw her every time I was in the house, but twenty three years had made great alterations on the pretty face of which St. Hiliare had only a few glimpses. She had, however, several daughters grown up, who were no less shy, than the mother was in her younger days. As soon as the Colonel ascertained that I was acquainted with the practice of medicine, he talked upon no other subject, being, as he said himself, a Curioso, which is the appellation given to those who dabble in any profession, without having been regularly educated to it. As a number of his slaves were indisposed, I accompanied him on a visit to each in succession, his object being to ascertain whether he was treating them properly, and to have my advice respecting their complaints. His usual guide in these matters, was a Portuguese translation of Buchan's Domestic Medicine. I found all over Brazil, individuals possessed of no better information, who made a livelihood by their practice of

* Voyage dans les Provinas de Rio de Janeiro et de Minas Geraes, t. 2. p. 350.

medicine, passing from town to town, and from Fazenda to Fazenda, many of them, like their brethren in Europe, making large sums of money by their pretended skill in this science.

This Fazenda was one of the best I had then seen in the interior; the Colonel's house, which was of two stories, those of his slaves, his store-houses, and other offices, were arranged in the form of a square; near the house was a garden, in which most of the common European vegetables were cultivated with great care, and yielded good crops. It was here that, for the first time since I left the coast at Aracaty, I saw water employed to drive a wheel, as a substitute for manual labour, in the grinding of mandiocca, &c.; this wheel was about fifteen feet in diameter, and was well supplied on the overshot principle, with water, from a small stream that passed at some distance, conveyed in a well constructed wooden aqueduct: this power served alike for the grinding of mandiocca, of cane, of Indian corn, and for bruising castor oil seeds. The Colonel every year prepares a considerable quantity of castor oil, which is of better quality than any I have seen made in other parts of Brazil; it is used principally for burning in lamps, but a little is also employed medicinally. The property belonging to Colonel Virciani, is well adapted both for the rearing of cattle, and the cultivation of sugar cane, and it is from these sources that he principally derives his large income. The mandiocca, Indian corn, &c. which he cultivates, is grown in quantities, not more than sufficient for the consumption of his household and slaves. Besides an abundant supply of corn for my horses, for which he would not accept payment, the Colonel provided me with a small quantity

of tea, as my stock was then nearly exhausted, and none could be purchased either in San Romão, or Formigas. Colonel Virciani and his family used it constantly, procuring at intervals an entire chest from Rio de Janeiro.

On the morning we left San Eloi we did not depart till after breakfast; so that we only accomplished a distance of about two leagues and a half, passing through an elevated level country, large tracts of which were covered with low shrubs, forming that kind of vegetation called Carrasco; we then halted for a short time under a large Silk-Cotton tree, near an open marshy Campo, in which a fine stemless *Eriocaulon* grew in great abundance. In the afternoon we made another journey of about a league and a half, through an upland, grassy, hilly country, and towards dusk, arrived at the Fazenda do Sitio, which belongs to the Guarda-Môr, Gonsalvo Christovão Pereira d'Alcami, from whom, though I carried no letter of recommendation to him, I received a most hospitable reception; rooms were immediately prepared for our use, and during the day and a half we remained there, both Mr. Walker and I were entertained at his table; his house, which is an excellent one of two stories, is situated in a hollow, from which the view of the hilly country in the distance is very fine. I remained here a day longer than I had intended, finding my collection of plants so great, that it became necessary to arrange them; this occupied me a whole day, and I had fortunately the assistance of a bright sunshine, which enabled me to dry all the moist paper, and to place all the specimens in dry sheets. A fine stream flowing from the hills, passes close to the house, and in a walk I took along its banks

in the afternoon, I added many botanical novelties to my collection. I was informed by our host, that in the gravel of this stream, two or three diamonds had been found, from which it was evident that we were now on the verge of that district, to which this precious stone gives its name. My collections having been all put into order, I had resolved to resume the journey early next morning, but in this I was disappointed in consequence of one of my horses having strayed into the woods, and therefore our departure was delayed till the afternoon. I had here again the choice of two roads, one winding round the foot of a very high Serra, which, although longer, was much better than the other that passed over the top of the Serra; I preferred the latter on account of the very different vegetation I expected to find there, but as regarded the horses, which were not at all in good condition, the former would have been the better. The Guarda-Môr wished me to remain another night, in order to avoid sleeping on the top of the mountain far from any house, but as we were all much accustomed to this, it gave us no concern, although afterwards, we had reason to regret our decision. Shortly after leaving the Fazenda, we ascended a Serra of considerable height, barely wooded with a few low shrubs, the greater part of which, consisted of three species of *Lychnophora*. Continuing along the undulating top of this, we reached another ascent, stony, and difficult in the extreme for the horses, which terminated in a rocky, and rather flat top of considerable length. This place presented quite an alpine appearance; the rugged arenaceous schistose rocks, and even the ground, as well as the small shrubs, had a hoary appearance, from the

numerous Lichens by which they were covered; and the cold we experienced, was quite in unison with the aspect of the country. With the exception of the elevated ranges of the Organ mountains, this was the richest botanical field I had met with during my long peregrinations; so numerous indeed were the objects that presented themselves on every side, each more beautiful or more curious than the other, that I was obliged to restrict myself in the number of specimens collected, so that I might obtain at least a few of each kind. The shrubs here consisted of different species of *Lychnophora*, beautiful *Melastomacea*, a *Virgularia*, covered with rose-coloured blossoms, several *Hypti*, a *Panax* &c.; and among these grew many curious kinds of *Eriocaulon*, and other small herbaceous plants. The soil here was rather boggy, and numerous little rills of limpid water were flowing down the mountain in all directions. Leaving this flat, we entered upon a third ascent, steeper and more stony than the previous one, which shortly brought us to a flattish, grassy, somewhat shrubby tract; on this ascent, a different vegetation again presented itself, two of the most beautiful of the plants being a species of *Physocalyx*, a handsome shrub about three feet high, with numerous orange-red flowers, surrounded by a large inflated calyx of nearly the same colour; and a beautiful scarlet-flowered *Lisianthus*. We proceeded on the flat top of this ridge about half a league, every step yielding some new plant. It was quite dark before we arrived at a place suitable for our encampment; this was a dry, sandy, grassy spot, by the side of the path; there were only a few small trees in the immediate neighbourhood, and the men, by groping beneath

them, obtained as many dry sticks as sufficed to make a small fire wherewith to cook our supper.

The sky was quite clear on our arrival, but shortly afterwards a thunder storm was seen gathering to the westward, and no sooner were we laid down on our hide beds, by the side of the fire, than the rain began to fall, and having no shelter of any kind, we were soon completely drenched, the men, in their anxiety to keep the fire alight, held a hide over it till the storm ceased. The flashes of lightning were extremely vivid, and the peals of thunder fearfully loud. After it had passed over, we made ourselves as comfortable as our circumstances would permit, and laid ourselves down, in the hope of not being again disturbed. In this, however, we were sadly disappointed, for shortly after we had fallen asleep, the storm returned in all its fury, leaving us in a far worse state than we had previously been. Those only who have passed a night under such circumstances, can imagine the annoyance we experienced; could we have foreseen the probability of its occurrence, we might have been better prepared for it, but, in the middle of the dry season, we certainly had no reason to expect so much rain. A third time we laid ourselves down, not to sleep, because that was now impossible cold and wet as we were, for the fire had been completely extinguished by the quantity of rain that had fallen.

When daylight broke, I found the place where we were encamped to be one of the most lovely that can be conceived, abounding in a variety of beautiful shrubs, and many curious plants. We remained here till noon, in the expectation that the sun would shine with force sufficient

to enable us to dry all the things that had been wetted by the rain during the night, but the whole forenoon continuing cloudy, we resolved to pursue our journey; in the morning, immediately after breakfast, I returned with one of my men to the top of the last ascent we had passed the night before; and made several other shorter excursions in the vicinity of the encampment, by which, many interesting novelties were added to my collections. We did not start till shortly after midday, when, after a fatiguing journey of three long leagues, we arrived at a very recently established Gold working, called Lavrinha. Our route was entirely along the flat top of the Serra, sometimes passing through large open grassy tracts, abounding in numerous kinds of *Eriocaulon, Melastomaceæ, Compositæ*, a blue flowered *Lupinus*, a small *Virgularia* with pale rose-coloured flowers, great profusion of a purple *Vellozia*, and the beautiful scarlet-flowered *Lisianthus*, &c.; and sometimes through rugged tracts thinly wooded with small shrubs, among them, numerous *Melastomaceæ*, many of them with small imbricated leaves, and large rose-coloured blossoms, forming the most elegant little bushe imaginable, in general habit not unlike heaths. Although this journey was very fatiguing to the animals, to me it was exciting and delightful in the extreme; the whole country through which we had passed for nearly two days, was one vast flower garden, where, 'like a child at a feast', I knew not which object to grasp at first, every thing was not only new to me, but each more beautiful, or more curious than the other. In this upland region a solemn silence reigned, not a single animal of any description having been observed during our progress through

it, nor any sound heard except that made by ourselves.

We reached Lavrinha about 5 o'clock in the afternoon; and although the sun shone brillantly during the better part of our journey, it was too late to attempt drying any of our things, when we arrived. Lavrinha, as I have already stated, is a small Gold working, then but recently established. The only buildings near it, were a small hut, made of a few posts and poles, covered with Buriti palm leaves, where the overseer slept, and a few sheds of the same materials, for the shelter of the slaves; we obtained accommodation in one corner of the former. A small stream that passes close by, but which is only supplied with water in the rainy season, had offered some indications of Gold, which induced some rich Fazendeiros, among whom were Colonel Virciani, and the Guarda-Môr, to form themselves into a society, six months before my visit, with the object of establishing a working; accordingly, about forty slaves were sent to carry on the operations, under the directions of the person who first discovered the Gold, and who, for his labour, obtained a number of shares in the concern. The vein from which the Gold found in this small stream had been washed, was discovered proceeding downwards through a soft white arenaceous schistose rock, and at the period of my visit, they had mined to the depth of about thirty feet. I found them then occupied in washing the material they had taken out, which proved to be very uncertain in its product, some days yielding one, two, and three ounces of Gold, but more frequently the amount was less than an ounce. A short time before our arrival, as much as four ounces resulted from a single days labour, but it had

again diminished to less than an ounce; it appeared to me, from the awkward manner in which the works were then carried on, that they would never turn to profitable account, as the person in charge of the operations, was not only quite ignorant of the art of mining, but unacquainted with the most simple operations in mechanics. While employed in the labour of excavating, a considerable amount of water was constantly flowing into the mine from two springs, and this was again drawn out in buckets, by hand labour, continued both day and night, whereas a pump, of no large diameter, would have served to carry off the water more quickly and effectually, and saved the labour of at least ten or twelve men; when I mentioned this to the manager, he told me, that no one in the neighbourhood had the smallest idea of the construction of a pump. Even a common winch and buckets, would have been far better than the plan here adopted, but such was the low state of their mechanical knowledge, that they knew not how to construct even so simple a machine.

The following day being one of clear sunshine, we were occupied all the forenoon in drying our wet clothes, and in arranging the large collection of specimens, made the day before; and in the afternoon, I took several short walks in the neighbourhood in quest of novelties. Lavrinha is situated on the southern extremity of the Serra, in a hollow, surrounded by rocky hills, somewhat lower than those which form the more northern parts of the Serra. Here I again made numerous collections, among which, were two fine Orchideous plants, both species of the beautiful genus *Lælia*, one of them bearing violet-coloured, and the other bright yellow flowers. In dry arid clefts in the rocks grew

several curious little *Vellozias*, and *Eriocaulons*; one of the latter was a branched species about six feet high. Having so frequently mentioned this curious tribe of plants, I will here make a few observations upon them. When Linnæus published the last edition of his *Species Plantarum*, in 1764, he described only five species, from all parts of the world, while from Brazil alone, my herbarium contains upwards of one hundred. Only one species is found in Great Britain, a little grass-like plant, with a single flowering stem about six inches long, bearing a small globular head of minute white flowers. It is found only in lakes in the Isle of Skye, and in the west of Ireland. Very few of the Brazilian plants bear much resemblance to this northern species, for a great number of them are large suffruticose plants, often obtaining a height of from four to six feet, with leafy, very much branched stems, each branchlet terminated by a large white ball, composed of a vast number of smaller heads, placed on peduncles of unequal length. Another remarkable circumstance connected with these strange plants, is the fact, that the greater number of the Brazilian species do not inhabit water, in the manner of our native British one, but grow in the most dry and arid portions of mountainous declivities; many others also grow in parched, flat, sandy places, which are flooded in the wet season; the truly aquatic Brazilian kinds, more or less resemble our own in habit.*

Shortly after leaving Lavrinha, we began to descend the Serra, which, on this side, is of no great height; the road

* Since my return to England, I have described several of these curious plants, in the sixth vol. of Hooker's 'Icones Plantarum.'

was very bad, turning and winding among large blocks of rock, and covered with loose stones, which rolled under the horses feet, and rendered our downward progress not a little dangerous. Having at length accomplished the descent, we found ourselves on a comparatively good road, and in a flat country, being, in fact, a large valley surrounded by hills, and presenting several small swamps where a few Buriti palms grew, but which, from their diminutive stature, compared with those we had seen in similar situations in the provinces of Piauhy and Goyaz, did not appear to thrive under the great degree of cold to which they are here exposed. After travelling about two leagues and a half, we halted during the middle of the day, in a shady place by the side of a small rivulet, opposite a rounded knoll, which was covered with *Lychnophora pinaster*, bearing much resemblance to the Scotch Fir, and a large kind of tree-lily. Proceeding in the afternoon through the same valley, which had now become gradually narrower, and which was bounded by two long ranges of bare grassy hills, we arrived about sunset, on the banks of a small river, called the Rio Inhacica, and took up our quarters for the night, in the open veranda of a small Venda, the only house in the place; we fully expected to have purchased here some addition to our stock of provisions, but the only article to be found for sale, was rum; not long after our arrival, however, a person belonging to the house, returned from the river with a fine fish, about a foot and a half long, which I gladly bought for a small sum, and it afforded us an excellent supper. While engaged in arranging my plants, and placing the specimens in paper, I was surprised to hear from the proprietor of the Venda,

a middle aged mulatto, who was standing by looking on, that he also was well acquainted with that kind of occupation, having been in the employment of Drs. Spix and Martius, during their excursions in the provinces of Minas Geräes, Goyaz, and Bahia; he spoke in the highest terms of the kindness he received from these travellers, and the pleasant life he led while in their service, the only drawback to which, was the great trouble he often experienced in drying the paper, for preserving their botanical specimens; this I could well believe, as I found from experience, that the men did not at all relish such labour, being often obliged, in cloudy and rainy weather, to dry every day several reams, sheet by sheet, over the fire.

The mulatto, being the ferryman, passed the luggage safely over to the opposite side of the river in a canoe; we were again annoyed by our too frequent cause of detention, the straying of one of the horses, which was not found till near mid-day, so that we were not able to accomplish that day, more than about three leagues. The country still continued flat, with the exception of one or two low, dry, gravelly hills, that we passed over; in many places, particularly in the hollows, it was pretty well wooded with small evergreen trees. The day was very hot and sultry, and as I suffered much from a severe headache, I was extremely glad when we arrived early in the afternoon at our destination, which was a little hamlet, consisting of about half a dozen houses, called As Vargems; we were allowed to take up our quarters in an open shed, belonging to one of the houses, used for the preparation of farinha de mandiocca, in which process several persons were then employed. The wheel used

for grinding the root, was driven by a small water-wheel, which, although very rudely constructed, answered the purpose extremely well, and saved much manual labour. The little streams of water, which are so frequent in the hilly districts of the province of Minas Geräes, afford the inhabitants great advantages over those of the dry northern provinces. This was only the second time I had seen water power applied to such purposes, but in travelling further south, I found it generally used. The people belonging to the house where we rested, were nearly white, and appeared to be very poor, but they were very civil and kind.

A journey of about a league and a half from As Vargems, through a flat valley, bounded on the right by a high bare rocky Serra, brought us to another small stream, called Rio Inhahy, which, being here of no inconvenient depth, the horses forded in safety, with all the luggage. On a rising ground, a little beyond the river, we observed a large house, close to what appeared to be the ruins of a church, but we afterwards learned, that it was a Registo, or place where all travellers, who passed into or out of the Diamond district proper, of which this is one of the boundaries, were duly examined, in order to prevent any contraband extraction of diamonds, a system of precaution, that was chiefly in vigour prior to the independence of Brazil, when the workings of this precious stone were carried on entirely by the government. On reaching the house, we found it uninhabited, and fast falling into a state of decay; we took possession of one of the largest apartments, which being well roofed, afforded us better shelter from the sun, than we could have obtained under

the shade of a tree. It was late in the afternoon before we left this place, having employed the morning in repairing the horses trappings, and we did not accomplish more than half a league of our journey, our route being, for the greater part of the way, over a bare grassy hill, where I found a few shrubs in flower; we encamped for the night under some trees in a hollow, by the side of a little limpid stream. Another short journey of somewhat more than half a league, brought us early in the forenoon of the following day, to a place known by the name of Bassoras and Areas, on the banks of the Rio Jiquitinhonha. Although this river is not very large here, we found it too deep to venture the luggage upon the horses backs, and as there was no canoe, no alternative remained, but to have it carried over on the heads of the men; this occupied so much time, that we found it too late to proceed further before breakfast.

I was afterwards glad that we were obliged to remain here, as it afforded me an opportunity of witnessing the operations carried on in one of the largest Diamond mines, if not the largest, at this time worked in the district. The principal house in this place, belonged to Captain José d'Almeida e Silva, who was also the proprietor of the mine; as no large tree could be found under which we could take shelter, I was directed to the house of the captain, who would be most likely to afford us accommodation, during the short time we intended to remain here, and seeing him at the door, I accosted him with this view, when he politely informed me, that the only place he could give us, was an open shed, to which he pointed, where some black carpenters were at work.

About half an hour after we had established ourselves in this not very comfortable place, and while employed in arranging the collections made during my mornings ride, the captain having learned the nature of my occupation, came over to offer me the use of an empty room in his house, but as all my luggage was now unpacked, I thanked him for his kindness and declined his invitation; he, however, politely pressed me to remain all day, that I might see how the mining operations were carried on. About an hour after we arrived, a troop of several mules came in from one of his Fazendas, with provisions for his slaves, and very soon after, he sent me a present of fruit, consisting of a basket of fine oranges, and another of Jabuticabas, both of which we greatly enjoyed, as we had not tasted fruit of any kind for a long time. The Jabuticaba is the fruit of a species of *Eugenia* (*E. cauliflora*, Mart.), which grows wild in the woods of the south of Brazil, and is also cultivated in most of the gardens in the Diamond and Gold districts. It is of a black colour, about the size of a green-gage plum, of a pulpy consistence, and very refreshing.

The mine of Captain Almeida was close to the Rio Jiquitinhonha, upon an elbow of land that at one time must have formed the bed of the river; a mine in the neighbourhood had been worked by the government about forty years ago, which yielded, in the course of three years, not less than thirty-seven lbs. six drs. of diamonds;* the formation, as it is called, becoming ex-

* For an excellent description of the Diamond mines, and an account of the manner in which the workings were carried on while under the administration of the government, the reader is referred to

hausted at the end of this period, the mine was abandoned; in the expectation of similar good fortune, Capt. Almeida commenced operations near the same place, about seven months before my visit, with upwards of a hundred and fifty slaves, all of whom were hired from his neighbours. At an expense of about £1,000 sterling, he brought a small stream of water from a distance of a league and a half, opened a large excavation, and erected pumps, worked by a water-wheel, for the purpose of clearing the mine of water. The excavation was carried on to the depth of about thirty feet, without encountering any proper diamond formation, although on being washed, it yielded a small number of stones, of no great value. A short time before my arrival, he commenced another excavation in the same neighbourhood, about forty yards square. The different kinds of soil through which it was necessary to cut, before reaching the deposit in which the diamonds were found, were in the first place, about twenty feet of a reddish sandy soil, which was loosened by the hoe, and then washed into the river by a current of water; issuing from the small stream that served to work the water wheel; below this was about eight feet of a tough yellowish clay, which was dug out by the hoe, and carried away on the heads of negroes, in flat wooden bowls, about a foot and a half in diameter, no such implement as a barrow being known here; beneath this clay appeared a layer of coarse reddish sand, about two feet and a half in thickness, below which was found the peculiar soil that contains the diamonds. When this

the work of M. Auguste de Saint Hilaire. 'Voyage dans le district des Diamans et sur le Littoral du Brésil,' Paris 1833.

diamond formation consists of loose gravel, it is called Cascalho in the language of the miners, and Canga, when found in the shape of a ferruginous conglomerate; this bed varies from one to four feet in thickness, and the gravel of which it is composed, consists of small pebbles of primitive rocks, which, from their rounded and polished nature, have evidently at some distant period, formed the bed of a stream of running water; these pebbles are of various kinds, but when there appears much of what they call Esmeril preto, a variety of tourmaline, the Cascalho is considered to be rich in diamonds. The Cascalho generally rests upon a substratum of a kind of hard clay called Pizarra, beneath which are found the solid schistose rocks, which generally prevail throughout the whole Diamond district. Sometimes Canga, or the agglutinated gravel, rests upon a rock called Marmore, which appeared, from the description of it given by Captain Almeida, to be a kind of limestone; and when this occurs, it is always found to be rich in diamonds.

The manner in which the washing of the Cascalho is carried on, is the following; along one side of a pond of water, is placed a range of eleven troughs, about three feet square, made of small straight stakes driven into the ground, the side next to the water, being much lower than the others; the bottom is made of clay closely rammed down; these troughs are called Bacós, and into each of them, a portion of Cascalho is put by a slave stationed there for that purpose; immediately in front of each Bacó, stands a slave up to his knees in water, having a large flat wooden plate (Bateia), with which he dashes water upon the Cascalho with considerable force; by

this means, and by stirring it at frequent intervals with a small kind of hoe, it is freed from the earth and sand with which it is mixed, when the larger particles of gravel making their appearance on the surface, are taken out; it is during this process that the largest diamonds are generally found. Immediately in front of these troughs, and about three feet above the level of the ground, separate seats are erected for two overseers, each armed with a long leathern whip, who keep a strict look-out, that no diamonds are stolen. This labour is continued from morning till abont four o'clock in the afternoon, when the Cascalho, thus washed and purified, is taken out of the Bacós, and carried to the side of a little stream of running water, to be finally washed. On accompanying the Captain to witness the performance of this operation, which to the stranger is the most interesting process in diamond mining, I found seven slaves, seated on the side of a small canal about four feet broad, with their legs in the water nearly up to their knees; this little stream of running water is called the Lavadeira. Each of the slaves had a large flat wooden plate, similar to that used in washing the rough Cascalho, into which a small shovelful of the purified Cascalho, was put by a slave stationed behind the others, for that purpose. This done, the washer filled the Bateia with water, and whirling it round in a peculiar manner on the surface of the stream, the larger gravel rose to the top, and was carefully examined. This being repeated several times, he then placed the Bateia on his knees, the right knee being considerably lower than the left, when with his hand he threw water on the fine gravel, which was thus washed

out with great care into the canal, continuing in this manner until the Bateia was empty; it is in this last process that diamonds are expected to be found. A small Bateia, containing a little water, was placed on a low pedestal, between the two overseers, and into this the diamonds were put, as they were found, which on this occasion amounted to eleven, all of which, however, were small. In the bottom of the Bateias is always found a small quantity of gold dust, which is carefully preserved.

Although diamonds are usually found in the diluvial gravelly soil above described, that is not however the matrix in which they have originally been formed. Whatever may be the case in other countries, I remained perfectly satisfied that here, they have originally been formed in the metamorphic quarto-schistose rock, of which the mountains in the Diamond district are constituted, and that they have, during a long series of years, been washed down along with the other debris, to the places where they are now found so abundantly. These rocks are rather soft in their nature, and of course easily disintegrated; hence the many wild ravines which intersect this range, excavated by the small streams that flow from it. Small masses of the rock have frequently been found containing diamonds imbedded in them; in the Cidade Diamantina I saw two beautiful specimens, in each of which, one half of a small diamond was exposed; the extravagant price asked for them, prevented me from purchasing either.

When we read in books, that the diamond is a production of the most recent geological epoch, as stated, for

instance, by Dr. A. Petzholdt in Jamieson's Journal, No. 68, we cannot help imagining that those who promulgate such opinions, have been led astray by travellers, who have listened to the idle stories of the uneducated inhabitants of Diamond countries, who almost all assert, that diamonds are regenerated in the course of a few years, in the soil from which others had previously been taken. This I found to be a very common opinion in Brazil; but those best able to form a just conclusion on the subject, for instance such intelligent miners, as Captain Josè D'Almeida e Silva, believe otherwise. It is true that he, as well as others, have frequently a second time washed the same Cascalho that had been worked when the government held the monopoly in its own hands, not because they believed new diamonds to have been since formed, but because they well knew, that in those times, the Cascalho was not so carefully examined as it is at present; indeed notwithstanding the most careful scrutiny, it is believed that some diamonds still escape notice.

We resumed our journey on the following morning, and after travelling about two leagues and a half, we halted to breakfast in an open shed, belonging to a house by the road side, which was then uninhabited. The country through which we passed, was hilly and well wooded with small trees and shrubs. The ascent and descent of the higher hills, are much facilitated by the care bestowed on the formation of the roads, as they are well paved with large flat blocks of the schistose rocks of which the mountains are composed. In many places, however, the pavement is beginning to give way, from the water flowing over it in the rainy season, and if not

repaired, it will soon fall into a very ruinous state. A wooden bridge also, which crossed a small river, and which appears to have been at one time of excellent construction, was now in such a decayed state, that no one could venture to pass over it; we were consequently obliged to ford the stream a little way below the bridge. In the bed of the river we saw several groups of people washing for diamonds. Early in the afternoon, we started for the Arraial de Mendanha, only half a league distant; the road led through a flat bushy valley, surrounded on both sides by mountains, those on the left rose to a considerable height, and presented the same bare arid rocky aspect as the mountains in the Highlands of Scotland. In the middle of this valley ran the Rio Jiquitinhonha, which we crossed, to reach the village on the opposite side, this was easily accomplished over a well constructed wooden bridge of considerable span, on which is a toll-bar, the first we had yet met with in the country, and this afforded evidence, that we were now approaching a more civilized part of Brazil, than any we had yet traversed. At this bar, I had to pay forty reis for each loaded horse, and twenty for each of my men, which I did with much pleasure, as I well knew the labour and risk encountered in passing the luggage over rivers, when not provided with bridges. On enquiring for a place where we might pass the night, we were directed to the public Rancho, but finding it a small place, extremely dirty, and occupied by a number of black Tropeiros, I could not think of taking up my quarters there. Ranchos are large sheds generally open at the sides, and built near a venda, for the accommoda-

tion of travellers. This was the first I had seen since leaving the coast, but I afterwards found them very common on the more frequented roads in Minas, but particularly on the great highway, between the Gold district and Rio de Janeiro. Rather than remain at the Rancho, I preferred hiring an empty house for the night, and obtained, at last, after some trouble, the keys of one that was newly built.

The Arraial de Mendanha appeared to be a flourishing little place, containing a population of about eight hundred persons, nearly every house being inhabited. The situation of the village, although romantic, is far from fertile, being on the bare rocky bottom of a high mountain, which nearly overhangs it, with little or no ground in its vicinity fitted for plantations of any description. The greater part of the inhabitants obtain an income by employing their slaves in mining for diamonds, or by keeping shops to supply the others with provisions and clothing, principally in exchange for diamonds and gold-dust, and were it not indeed, for the diamond mines that exist in the neighbourhood, not a single house would have been erected in this place. Soon after leaving Mendanha on the following day, we began the ascent of the Serra, which bears the same name; it was about a league in length, and notwithstanding its steepness in many places, the excellence of the road rendered it comparatively easy. In nearly its whole extent, it is well paved with large flat blocks of the sandy schistose rock, of which the Serra is formed, taking a zigzag direction, where the ascent is steepest; the lower part of the Serra, particularly along a deep ravine, by the side of which the

road leads, is pretty well wooded with small trees and shrubs, but towards the summit, it presents the same bare alpine appearance as that we had crossed before reaching the little gold mine at Lavrinha. I walked up the greater part of the ascent on foot, botanizing all the way, and picked up several novelties. From the summit to Duas Pontes, which is a league distant, the road leads through a flat rocky and bushy country, with some elevated ridges on the left, covered with a very stunted shrubby vegetation. At Duas Pontes, where we halted to breakfast, we found two houses, being the only ones existing between Mendanha, and the Cidade Diamantina, a distance of four leagues; the place takes its name from two bridges which exist near it, standing about a mile distant from each other, both very well constructed of timber. One of the houses was a small Venda belonging to a negro, who informed me that he was a native of Africa, and had worked for many years as a slave in diamond washing, but that by the provident use of his privilege of working on his own account on Sundays and holidays, he had been fortunate enough to find as many diamonds as enabled him, not only to purchase his freedom, but that also of his wife and several children. Near this place I found a species of *Rubus* loaded with fruit, which forcibly reminded me of the days of my boyhood, and the bramble hedges of my native country. In open places, I met with a few specimens of a second species of *Physocalyx*, and a beautiful *Andromeda*, having large panicles of crimson flowers. We were now only two leagues distant from the Cidade Diamantina, a journey that might easly have been accomplished that afternoon,

but not wishing to enter it by night, owing to the great difficulty a stranger always experiences in finding accommodation, as well for himself as for his animals; under such circumstances, I resolved to take up my abode for the night, in an open Campo on the top of the Serra, near a small stream of water, within half a league from the city. The country through which we passed on this short journey, was almost entirely destitute both of trees and shrubs, consisting chiefly of large undulating grassy Campos, in many places abounding in great blocks of rocks, similar to that of which the Serra is composed. Two miles before reaching the place where we halted, we obtained a most extensive view of the country to the eastward, which is perhaps one of the most rugged, and arid regions existing in Brazil; as far as the eye could reach, nothing was to be seen but hundreds of bare hills, whose barren tops were whitened by the numerous *Lichens* with which the rocks were covered. Overlooking these lower ridges stood the lofty peak called Itambé, the top of which is upwards of 6,000 feet above the level of the sea. It was with great difficulty the men could find as much wood as would make a small fire to cook our supper, and we were obliged, for the first time, to lay ourselves down to sleep without a large fire burning all night, at a time too, when the cold was greater than any we had yet experienced.

On rising in the morning, the thermometer indicated 54°, Fah^{t}, under which temperature we were all shivering with excessive cold, so long accustomed as we had been to a warmer climate. In an hour's time, after resuming our journey, we commenced the descent of the Serra, over

a road constructed in the same manner as the ascent at Mendanha, but neither so long nor so steep; shortly after which, we came in sight of the famous Cidade Diamantina, or city of Diamonds; this capital of a rich province, occupies the whole acclivity of a Serra, equal in height to that we had just descended, from which it is separated by a narrow valley. The traveller approaches the city so suddenly, that it almost appears as if called into existence by the power of magic; he is astonished at the sight of so great an assemblage of large white washed houses, intermingled with many churches, rising gradually one above the other along the steep sides of the Serra, together with the numerous small plantations, by which the houses in the suburbs are surrounded, consisting of orange trees, bananas, and the usual productions of a tropical country; together with abundance of the compact growing Jabuticabeira, and many fine trees of the large grotesque Brazilian pine (*Araucaria Brasiliana*), which contrasts strangely with the rocky and absolutely bare country, that surrounds the city on all side: it is, indeed, an Oasis in the desert.

Having no letters of recommendation to any person in the city, I went immediately, on my arrival, to the house of the Juiz de Paz, to present my passport, and learning from him, that a small inn was to be found in the lower part of the city, I determined to put up there, until I could succeed in hiring an empty house for a few days; fortunately, the landlord had one to let, in the upper part of the city, whither we quickly removed, glad that we were not obliged to remain at the inn, where the accommodations were far from tempting.

This place, formerly known as the Arraial de Tijuco, was, in the year 1839, elevated to the dignity of a city, under the name of Cidade Diamantina, from its being the capital of the Diamond district. According to information which I received from the Juiz de Paz, its population amounted to about 6,000 souls; the streets are very irregular, and generally very narrow, as well as badly paved; both within the city, and in the suburbs, there are many fine houses, of two and three stories, and as there is abundance of excellent stone in the neighbourhood, nearly all are built of this material; they are constructed, however, at an enormous expense, owing to the great distance from which timber can be obtained; it is all dragged by bullocks from the Sertão, a distance of from four to sixteen leagues, over a rugged, hilly country, through which carts cannot pass; owing to the same reason, fire wood is extremely dear in the city, and very bad in quality, as it is often brought for sale in a half green state. Many slaves are employed by their owners in cutting the large shrubs that grow in the ravines, within a short distance from the city, the branches of which are made up into bundles, and offered for sale, from house to house; the stems of the large tree-lily (*Vellozia*) are also collected for fuel, particularly a kind that exudes abundance of resinous matter. The Tropeiros on approaching the city with their loaded mules, always bring with them, from the wooded countries, as many bundles of split wood, as suffice them for purposes of cooking, till the period of their departure.

Many of the shops are quite equal in appearance to those in Rio de Janeiro, and are provided with nearly the

same articles, the difference in price seldom exceeding twenty per cent; all European goods, with the exception of a few from Bahia, are brought from Rio on the backs of mules, which are daily to be seen arriving in troops, sometimes of a hundred at a time; with the exception of the few vegetables grown in the gardens around the city, every product consumed here as food, is brought from a distance of from ten to twenty leagues, and sold in two large market places, called Intendencias. These products consist chiefly of farinha de mandiocca, and Indian meal, the latter being much more extensively used in the province of Minas, than in the northern provinces; also, dried beef, sugar, pork, cheese, Indian corn, french beans, rice, and castor-oil, which is used to burn in lamps. The city contains three or four handsome churches, one called Nossa Senhora da Rosaria, belongs to the negroes from the coast of Africa, and where, over the high altar, is seen the figure of a black virgin. As we lived close to this church, I attended on several evenings, the celebration of one of its festivals, and found, not only the blacks who usually attend the church, but many of the most respectable male and female inhabitants of the city. Every thing was conducted with the greatest propriety, and on one evening I heard a very excellent sermon preached by one of the priests belonging to the city. During our stay a Novena was held in another of the churches, Nossa Senhora das Mercês, where I attended several times; on all these occasions I was particularly struck with the different mode in which the ladies dressed here, from that I had observed in other parts of the interior. In the large towns I had previously visited, I remarked

that a greater number of ladies attended church during the Novenas then any other time, when both the more respectable, as well as the poorer classes, were always dressed in their best attire; in the Cidade Diamantina, although the churches on such occasions were equally well attended, the most respectable ladies were not so well dressed as usual, and were it not that the superior classes avail themselves of the privilege of squatting on the floor before the altar, they would not be distinguished from the poorer individuals who take their station behind them. They all appear in the same kind of dress, which consists of a dark coloured cloth cloak, with a large cape, in which they muffle themselves; and a white handkerchief which is tied round the head, surmounted by a man's hat. During the three weeks I remained in the city, I never saw a lady walking abroad in any other kind of hat; some few were white, but black seemed the most fashionable.

The most elevated portion of the city is about 4,000 feet above the level of the sea, and the climate is consequently mild. During my stay in the month of July, the thermometer ranged from 54° to 60° at noon, a temperature we had long been unaccustomed to, and we suffered not a little from the cold. As a fire could only be kindled in the kitchen, we used all to get as close to it as possible, particularly in the morning; it was however during the night that we suffered most, for our bedclothes were too light for this climate, and my stock of money had now become so far reduced, that I could not afford to purchase additional blankets either for myself or my men. It was necessary to devote the little that I had,

to the purchase of a stock of provisions, for the continuation of our journey; there was no one here to whom I could apply for money, and we were still far from any of the English Mining establishments, where alone I could expect to obtain cash for bills on my agents in Rio de Janeiro. The coldest months in this region are May, June, and July; the hottest months are those of November, January, and February, during which period, the thermometer ranges from 74° to 88°, but mostly only reaching 84°. During the early part of the warm season, thunder storms are very frequent, which always came from the north. For a few days after our arrival, the air was clear and bracing, but a cold drizzling rain soon set in, which lasted nearly a week. The houses have generally a small garden attached to them, in which I observed most of the common European vegetables, such as potatoe, cabbage, pease, lettuce, parsley &c.; as well as many of the flowers that are ordinarily cultivated in the gardens of Europe. Some of the European fruit trees are also found in the gardens, such as the apple, pear, peach, fig, and quince. The city is abundantly supplied with excellent water, from springs that take their rise in the mountain on which it is situated. These streams are conducted into several of the houses, and many families are by this means, supplied with one of the greatest luxuries that can be enjoyed in a warm climate, at a very small expence; there are also several public fountains in different parts of the city,

The privilege of diamond washing, formerly a monopoly of the government, is now accessible to any individual who chooses to risk his time and capital in

this labour, a privilege only conceded since Brazil has declared its independence; all that is required, is that the adventurer should give notice to the Camara municipal, of the exact spot where he intends working, a notice demanded, in order to protect some of the virgin tracts still preserved as royal property. The greater portion of the inhabitants of the Cidade Diamantina who possess a few slaves, employ them in the washings, which are generally chosen in places where the Cascalho is near the surface, and near the beds of the little mountain streams, which are so numerous in the adjoining locality. Many free blacks also work on their own account, and thus obtain a precarious livelihood. The persons engaged in these adventures are generally a very improvident race, for even those who carry on the most extensive Serviços, as the workings are called, often run deeply in debt after a rich washing has been exhausted, before they succeed in finding another productive spot. I was assured by one of the most extensive miners in the district, that the excitement produced by this kind of life, is like that of a gambler, whoever enters upon it, never renounces it. The district which gives rise to this curious source of industry, is comprised within the space of fourteen leagues square, and it is beneath the mark to state, that 10,000 individuals subsist entirely upon the product of diamonds and gold extracted from its soil. It is not however so much the miners, as the shopkeepers, who reap the greater share of profit from this source of industry, all of whom trade more or less in diamonds and gold-dust, which they take from the miners in exchange for the supply of their own wants, and those of

their slaves. It is rare to meet with a miner, who is not in debt to some shopkeeper, to whom he is bound to give in payment the product of his washings, at a lower rate than he could obtain, if he had the advantage of offering them, in an open market to the highest bidder. The life of a shopkeeper, although not so exciting as that of a miner, is one however less subject to risk, he generally soon grows rich, while the poor miner struggles on in poverty, his greatest source of happiness existing in hopes that are seldom realized.

Slaves are allowed to work on their own account on Sundays and holidays, not in the Serviços of their masters, but any where else, except on the royal preserves; and it was told me as a remarkable fact, that most of the largest diamonds obtained in this district, have been found by slaves on these occasions; it is not however an unfair inference to conclude, that as the blacks are most expert thieves, some of those stones at least have been stolen. Better opportunities now exist for more readily disposing of diamonds thus obtained, than when the workings were entirely in the hands of the government. In those days they were mostly disposed of clandestinely to contraband dealers, many of whom used to hide themselves in the mountains by day, and at night, visit the huts of the slaves, to purchase the stolen property; even the shopkeepers were deeply engaged in these illicit transactions. The Juiz de Paz, who was during the period of my visit, one of the richest merchants in the city, owes his fortune to the following circumstance. At the time Brazil still remained under the dominion of Portugal, he was the proprietor of a

small shop, and occasionally made a journey to Rio de Janeiro to purchase goods. One evening returning from one of these long journies, having retired to rest earlier than usual, he heard some one knocking at his door, to which at first he paid no attention, concluding it to be only some customer, but, as the noise continued, he at last arose, when he saw a slave who had come to offer a large diamond for sale, that weighed about two penny-weights and a third. The price asked for it was six hundred mil-reis, at that time equal to about £180 sterling, but not having so much money in his possession at the moment, he was obliged to borrow some for the occasion. Early next morning he set off on his return to Rio de Janeiro, with his purchase, stating to his friends that he had forgotten some important business which could only be settled by his presence. On reaching the capital, he found it necessary to use great caution in endeavouring to dispose of his prize, as all trade in diamonds was at that time contraband, any one found dealing in them being condemned to ten years transportation to Angola, on the coast of Africa, his property being at the same time confiscated, and sold for the benefit of government. At last he was prevailed upon to dispose of it for 20,000 mil-reis, about £6,000, which amount was paid to him in hard dollars; never having seen so large a sum of money, he was perfectly astonished at its amount when it was brought to him, and after regarding it for some time, he asked with great simplicity if it all belonged to him. Shortly afterwards, the individual who bought the diamond, sold it for 40,000 mil-reis, and when the Juiz learned its great

value, and found that he might have sold it for at least a third more than he received, his mortification it is said was so great as to affect his mind. He has long however recovered from his chagrin, and is now one of the most active, as well as the most extensive Gold and Diamond merchants in the district.

The temperate climate enjoyed by the inhabitants of this part of the country, renders them more healthy than those who live in the Sertão; the women are the most beautiful I met with in Brazil, and the men are also a finer race than those of the low countries, many of them having more the appearance of Europeans, than of inhabitants of a tropical climate. The diseases most common here, are those induced by sudden variations of temperature, such as colds, and inflammatory complaints; the slaves who are constantly working up to their knees in water, are subject to rheumatism; their diet, which is not of the most nutritious nature, consists chiefly of boiled French beans, and Indian corn meal, (fubá) which, with the addition of hot water, is made into a thick paste, called Angú; this gives rise to general debility, particularly in those addicted to the immoderate use of rum. It is not the slaves only who are given to this vice, but whites of both sexes, in almost all classes of society, indulge in it to a great extent; this is in some degree manifest, from the very great quantity of that spirit daily brought to market, for it is said, that for every troop that enters the city with provisions, another arrives with rum from the sugar plantations in the low countries. I must confess that I saw but few instances of intoxication in the streets, except among persons of colour.

As I arrived in the city without letters of introduction, I made very few acquaintances among the inhabitants. During my stay, however, I received great kindness from Senhor Antonio Gomez de Carvalho, the Juiz de Paz, and Major Luiz José de Figueredo, the President of the Camara Municipal, both of whom called on me the day after we reached the city. M. Auguste de St. Hilaire, who visited these provinces in 1817, speaks in high terms of the great hospitality of the inhabitants of Minas Geräes, but they do not now appear disposed to treat foreigners with the same familiarity as formerly; this may be attributed to their greater intercourse with Europeans, particularly since the introduction of English mining companies, which has greatly tended to alter their character. In one of the houses where I occasionally visited, I met with Portuguese translations of Sir Walter Scott's 'Ivanhoe,' and 'Guy Mannering.' They had been sent from Rio de Janeiro to one of the daughters of the family by whom they had been read with the greatest admiration; she had received an excellent education, and composed verses fluently. I was rather surprised when informed that neither a bookseller's shop, nor a library, existed in the city.

During my residence in this place, news arrived that produced a great sensation; the young Emperor, Don Pedro the second, had been called upon to assume the reins of government, contrary to the wish of the regent, before he had attained the age provided by the Legislature; a proceeding that seemed to be highly approved of by the greater part of the inhabitants, and rejoicings were consequently made on the occasion; in the afternoon,

high mass was celebrated in the Matriz church, at which were present all the members of the town council, as well as the whole body of the national guard, then in town. In the evening, there was a general illumination, and the national guard, after firing several vollies, in front of the house of the commandant, paraded through the principal streets, with the band playing, accompanied by the town council, and all the principal inhabitants of the city. I walked along with the council, having been invited to do so by the president, and had thus a good opportunity of witnessing the whole proceedings; every now and then, a halt was made before the house of some respectable citizen, where, generally five or six persons recited verses, composed during the day in honour of the occasion, while the ladies of the house, from the balconies, were showering down flowers perfumed with Eau de Cologne; and occasionally the crowd below, was honoured by a song from one of the fair ones. This was repeated for three successive nights; many of the verses produced on this occasion, were extremely appropriate, but a greater part consisted of the most fulsome adulation of the young Emperor, which was perhaps as unmeaning and ephemeral, as that bestowed on his father, who when he proclaimed the independence of Brazil, received honours from these same people, little short of those bestowed on a Deity, but who after a propitious reign of ten years, was suffered to abdicate in favour of his infant son, without any expression of regret on their part: on the contrary, they appeared to rejoice in a measure, that tended to the consummation of those republican views, which at that period, seemed likely to draw the Empire into one

general vortex of anarchy and confusion; happily however for the country, the greater portion of the community, had the good sense to resume its attachment to those monarchical institutions, that seem well adapted to the habits and manners of the Brazilian people, and I had now the good fortune to witness the exuberant effusions of an enthusiasm, which I hope will prove more lasting, than that exhibited by them on a former occasion towards the illustrious founder of the Brazilian Empire.

When we arrived in the Cidade Diamantina, my horses were in bad condition, owing to the long and fatiguing journey they had just accomplished, and the bad pastures on which they had latterly been obliged to feed, I found however to my regret, that the pasturage here was still worse, and I feared, that by the time I was ready to leave, they would not be in a condition to resume the journey; the only pastures here, are to be found on the top of the Serra above the city, in a region very arid, and particularly cold at this season, whence indeed it derives its name of the Serro do Frio. Although they were fed twice a day with Indian corn, they grew thinner and weaker after the setting in of the cold rain, so that notwithstanding all our care and attention, eight of them died in the course of a few days. Finding the remaining ten were totally unfit for service, I thought it better to dispose of them at once, for a mere trifle (70 mil-reis), rather than see them die off one by one. The person who bought the horses, immediately removed them to the Sertão. As this occurred at a time when my stock of money was almost exhausted, with no immediate hope of being able to renew it, I was brought nearly to

a stand; with the money I received for the horses, I was enabled to hire a troop of mules, to convey us to Cidade do Serro (formerly Villa do Principe), which is ten leagues distant from the Cidade Diamantina, on the road towards Rio de Janeiro, and having made the necessary arrangements, I prepared for my departure.

CHAPTER XIII.

CIDADE DIAMANTINA TO OURO PRETO

Leaves the Cidade Diamantina—Reaches As Borbas—Passes the Arraial do Milho—Tres Barras—Arrives at the Cidade do Serro, formerly Villa do Principe—The Town described—Passes Tapanhuacanga—Retiro de Pahre Bento—N.S. de Conceiçao—Description of an Iron Smelting Work at Girao—Vast abundance of Iron Ores in this District—Reaches Escadinha—Morro de Gaspar Soares and two other Iron Smelting Works and Forges—Ponte Alta—Itambé—Passes Onça—Ponte de Machado, where frost was seen—And arrives at Cocaës—Visits the large Establishment of the Cocaës English Mining Company—The author's unkind reception, by the Director of that Establishment—Reaches S. Joao do Morro Grande, part of the Mining Establishment of the English Gongo Soco Company—hospitable reception, and visit to the Gold Mines—Its Workings described—Geological structure of the Mines, and the surrounding Country—Leaves Gongo Soco and passes Morro Velho—Rapoza—And reaches the Establishment of another English Mining Company at Morro Velho—The author's delight on receiving letters after two years absence—His kind reception and abode there—Village of Congonhas de Sabara described—Attached to the Gold Mines of Morro Velho—Account of those Mines—Mode of working and extracting Gold from the Ore—Visits the City of Sabará—Mining Establishment of Cuiaba—Serra de Piedade—And Serra del Curral del Rey—Leaves Morro Velho—Reaches the Villa de Caëté—Passes S. José de Morro Grande—Barra—Brumado—Serra de Caraça—Catas altas—Infiçcionado—Bento Rodriguez—Camargos—And Reaches San Cäetano—Visits the City of Mariana—Passes the Serra de Itacolumi—Arraial de Passagem—And arrives at the City of Ouro Preto, formerly Villa Rica—City described—its population—College—and Botanic Garden.

Before leaving the Cidade Diamantina, I made several excursions to the vallies, the ravines, and the mountain

tops in its vicinity, which yielded me many acquisitions; having made all the necessary preparations for our departure, we left early in the forenoon of the 15th of August. We made a journey of about three leagues, and remained for the night at a place called As Borbas, encamping in an open grassy spot, not far from the only house there, that belonged to a blacksmith; the road by which we travelled is the high way leading to Rio de Janeiro, and is perhaps the worst in the country, notwithstanding the great traffic here carried on, not only to the capital of the Diamond country, but also to that large district to the N.E. called Minas Novas. The numerous ascents and descents are very rocky, and full of large stones, the last ascent, of greater extent than the others, about a league from the city, leads to an open flat grassy country, the summit of the Serro do Frio. To the left we passed some higher ranges, one of which is the elevated Serra de Itambé; it was a very arid desolate tract, the few shrubs which grew on it, being two or three species of *Lychnophora*, called Candeia by the inhabitants, and the grotesque *Lychnocephalus tomentosus*, together with a few occasional clumps of *Vellozia*. Shortly before we reached As Borbas, we gradually descended to a considerable extent, by a rocky path, and entered a broad valley, which, though more wooded than the plain above, was still very arid in its appearance.

As some of the mules had strayed during the night, we were delayed at our encampment till near noon on the following day; this was not at all agreeable, for we were exposed to a hot sun, without any means of sheltering ourselves from its influence. As I had now

no animals of my own, I was obliged to submit to the will of the Tropeiro, who did not seem very anxious to proceed rapidly on his journey. We found the mode of travelling in the southern provinces very different from that we had been accustomed to in the northern. Horses are seldom or never used, and only one journey is made in the day, which according to the nature of the road, extends from three to four leagues. The troops which often consist of as many as from fifty to one hundred mules, are very well organized, those which are not conducted by the owner himself, being entrusted to a Arrieiro or muleteer, who, mounted on horseback, follows in the rear of the troop; it is he who gives the necessary orders for its starting and halting, looks to the condition of the pack saddles, and takes care the loads are well balanced, as otherwise they would gall the backs of the animals; it is also part of his business, to examine the feet of the mules, when the troop halts, to ascertain the state of their shoes, and replace those which may have been lost; the situation of Arrieiro is generally held by a free mulatto, and to him also the sale and purchase of goods is often entrusted. The roads in Brazil are so narrow, that the animals are obliged to go singly, one before the other, and so much are they accustomed to this, that even when the road is broad enough for many to go abreast, they still persist in the habit they have acquired of following one another. The troop is subdivided into divisions (lotes), of seven mules each, which are separately managed by a driver (Tocrado), who goes on foot, and is generally a negro. From As Borbas we made a journey of about three leagues and a half, through

a hilly, rocky, uninteresting country, and arrived at a place called Tres Barras. Shortly before reaching it we passed the Arraial de Milho Verde, but at a short distance to the south, at a place called Váo, we crossed a small river over an old half-rotten wooden bridge. At this place there are a few poor looking houses, the owners of which are principally diamond washers; one of them showed me a few diamonds, all of which were small, and not nearly equal in colour to those found near the Cidade Diamantina; one was jet black, a colour that not unfrequently occurs.

Leaving Tres Barras, another journey of three leagues and a half brought us to the Cidade do Serro. The road leads through a hilly and undulating country, evidently much lower than that in the Diamond district which we left behind at Tres Barras; it had now lost its barren rocky appearance, the greater part of the rounded hills being wooded to their tops, and occasionally, houses and plantations were to be seen in the hollows. In place of the gravelly soil which exists in the Diamond district, the red argillaceous ferruginous clay, so common in the country, again made its appearance. We came in sight of the city when about a league distant from it, and although much smaller than the Cidade Diamantina, its elevated situation gives it quite as striking an appearance. Like it, the greater part of the Cidade do Serro is built on the slope of a hill, which, however, is of less elevation, and the houses are not so closely crowded together. At this place I parted with the Tropeiro who brought us from the Cidade Diamantina, and as there was no inn of any description, I took up my quarters in

the public Rancho, which is a large well built house, expressly constructed for the accommodation of the troops that pass and repass, three only of which are allowed to rest in it at a time, and the proprietor charges four vintems (about two pence) per night to each Tropeiro for the accommodation. He has adjoining it, a large Venda, for the sale of provisions and Indian corn, and it is understood, that the Tropeiros are expected to purchase there what they require for themselves, their men, and their mules. At this Rancho I met with a muleteer returning to Ouro Preto, with his mules unloaded, eighteen of which I hired to carry us forward, and for which I agreed to pay him, on our arrival there, 180 mil-reis, or about 22*l.* sterling.

Cidade do Serro, formerly known by the name of Villa do Principe, is situated partly on the northern acclivity, and partly upon the ridge of a hill which runs from east to west, and consists, principally, of one long street, with a few others that intersect it; these are nearly all well paved, and the houses are, with but few exceptions, white-washed. As in the capital of the Diamond district, almost every house has a small garden, which gives to the city a very pleasing appearance, when seen from a distance. I remained here only part of a day, and had, therefore, little opportunity of gaining much information respecting it; it struck me, however, during a walk through its principal street, that it was a very dull place. According to St. Hilaire, it contained in the year 1817, a population of from 2,500 to 3,000 inhabitants; it has a few good shops, but the greater part of the respectable inhabitants are agriculturists, who have their

Fazendas in the neighbourhood. Gold at one time was found rather plentifully in the argillaccous soil, particularly in a small stream which runs in the valley below the city, called the Corrego de quatro vintems; it is now, however, nearly exhausted, and only a few of the more wealthy citizens employ some of their slaves in the search for this metal.

The hills around the Cidade do Serro, are covered with a grass which the Brazilians call Capim gordura (*Melinis minutiflora*, Nees ab. E.). It is covered with an oily viscous matter, and universally makes its appearance in those tracts, which have been cleared of virgin forest for the purposes of cultivation; both cattle and horses are very fond of it, but although they soon fatten on it, the latter get short-winded, if they feed on it for any length of time. Martius considers this plant to be truly a native of Minas Geräes, while St. Hilaire is of a different opinion; as it is now everywhere so common in this province, it is a difficult matter to say which of those excellent botanists are in the right; all the agriculturists that I have spoken with on the subject, agree with Saint Hilaire, although they differ in opinion in regard to the place of its original growth. It is only on the mountains, that it is found covering large tracts, and at present it is rapidly extending northwards. Saint Hilaire during his travels did not observe it beyond 17° 40′ of south latitude; but while crossing the Serra Geral from Goyaz to Minas, I met with it many degrees to the north of that parallel; I noticed it only near houses, and there is little doubt but that in the course of a few more years, it will over-run that chain, in the same manner that it has

done those of Minas. The seeds had evidently been brought from the latter country by troops, which pass that way into Goyaz; it is not to be met with at all in the Sertão. Another plant which makes its appearance with this grass, and one of the worst pests which the Brazilian farmer has to contend with, is the *Pteris caudata*, a large brake similar to that so common in many places in Great Britain; it is called by the common name of Samambaia.

Leaving the Cidade do Serro, and passing through a hilly country, which is more thickly wooded, and contains a greater number of habitations than that we had lately traversed, a journey of four leagues brought us to the Arraial de Tapanhuacanga, where we passed the night in the public Rancho; a large troop of about one hundred mules had arrived there before us, from Rio de Janeiro, loaded with European merchandize. This village is situated in a hollow, which is surrounded by some rather high hills, the nearest of which are covered with grass, a few solitary trees, and an immense number of the large clay nests of the white ant; while the more distant are covered with virgin forests. At the time the village was founded, gold was discovered abundantly in the neighbourhood, but it is now very nearly exhausted; it contains at present, only about twenty or thirty houses, the greater part of which are falling into ruin, and the two churches are in the same condition. Below the village runs a small stream, in the bed of which a few miserable beings still endeavour to earn a livelihood by washing for gold. While in the Rancho, one of the men belonging to the troop, brought in a

handful of branches, covered with leaves, with which, after holding them some time over the fire, so as to render them brittle, he made a kind of tea, for himself and his companions; from the fruit on it, I found it to be a species of *Symplocos*. The leaves of many other shrubs and trees are used in the same manner by the inhabitants of Minas, under the name of Congonha; those of the *Ilex Paraguayensis*, from which the celebrated Yerba of of Paraguay is prepared, are most commonly used.

We left Tapanhuacanga early next morning, and having acccomplished about five leagues and a half, we halted at a Fazenda, called Retiro de Padre Bento, a large house built on the gentle slope of a grassy hill; our whole journey indeed, was through an open, hilly, grassy country, the pasture being chiefly Capim gordura. In many places, the ground had been turned up to a great extent in search after gold, but the workings were all abandoned; large tracts were likewise covered with the tall brake of which I have already spoken. One of the most common trees I observed, was a fine large *Hyptis* (*H. membranacea*, Benth.) bearing great panicles of purple flowers; this tree is from twenty to forty feet high, and is one of the largest species of the family of the *Labiatæ* I met with in Brazil.

After travelling about half a league next morning, we passed through the Arraial de Nossa Senhora de Conceição de Mato Dentro. This village is situated in a hollow, on the banks of a small stream, and is surrounded by high grassy hills; it contains about two hundred houses arranged in two long parallel streets, and is one of the most miserable looking places I have ever seen;

many of the houses are falling into decay, and those which are still inhabited, are not even white-washed, but are merely covered with the red clay, used in plastering them. The country around has a barren aspect, but as the hills are all covered with Capim gordura, it does not look quite so sterile as that around the Cidade Diamantina; they are however, destitute of all those beautiful small shrubs, which render the mountains in the Diamond district so interesting to the botanist. Except a few small gardens attached to some of the houses, there are no signs of cultivation in the neighbourhood of Conceição. At a short distance from this village, the road passes over a high hill, upon reaching the top of which we got into a cold, dense mist, which was rolling down into the valley before the wind, but which disappeared as soon as it reached a warmer atmosphere. We travelled in the mist for about half a league, and finally emerged from it, by descending the opposite side of the Serra. On this descent we met another large troop, consisting of upwards of one hundred mules, part of which was destined to the Diamond district, and part to Minas Novas; the road was here so narrow, that our small troop was obliged to halt while the others passed.

About a league and a half from Conceição, we passed a small Iron work, belonging to a German blacksmith; it is situated in a most romantic spot on the banks of a small river, the waters of which rush through a narrow rocky channel, and is surrounded by hills, covered with virgin forests. The proprietor of this establishment told me that he had been eighteen years in

Brazil, seven of which had been spent at this place; his furnace is a small one, making only a hundred weight of iron per day; but he was about to erect another of equal size. The blasts for the furnace, and for the forging fires, as well as the large hammer by which the iron is beaten into bars, are worked by water. He had several men in his employ, making all kinds of iron implements used in the country, but principally shoes for mules, for which he finds a quick sale from the Tropeiros that are daily passing. He also manufactures a small quantity of steel, which he confessed to be of an inferior quality; there is abundance of iron-stone in the neighbourhood, and plenty of wood to make charcoal for reducing the ore. The province of Minas Geräes is perhaps richer than any part of the world in iron; indeed as Saint Hilaire observes, it may be considered as inexhaustible.* In Europe iron ore is generally found at a considerable depth, but in Minas it is frequently met with near the surface.

From Girão, for so this forge is called, we went on another league, and halted for the night in a public Rancho at a Fazenda called Escadinha. The country

* Martius in speaking of the productions of Minas Geräes, says: "almost every kind of metal is found here; iron-stone, which produces ninety per cent, is met with almost everywhere, and it constitutes in a manner, the chief component part of long chains; lead is found beyond the Rio de San Francisco in Abaité; copper in San Domingos, near Fanado in Minas Novas; chrome and manganese in Paraöpeba; platina, near Gaspar Soares, and in other rivers; quicksilver, arsenic, bismuth, antimony, and red-lead ore, about Villa Rica; diamonds in Tijuco and Abaité; yellow, blue, and white topazes, grass and bluish green aqua marines, red and green tourmalines, chrysoberyls, garnets and amethysts, principally in Minas Novas. But what has chiefly contributed to the great influx of settlers, and to the rapid population of this province, particularly of the capital, is the great abundance of gold which has been obtained for above a century". *Travels in Brazil, Lloyd's translation*, vol. 2, p. 181.

during the latter part of the journey was well wooded with virgin forests, similar to those on the Organ Mountains, and like them abounding in tree-ferns, small palms, and a large species of bamboo. It was quite refreshing to be once more in such a region, after wandering so long in the arid provinces of the north.

On the following morning, after travelling about two leagues, we passed a small village called the Arraial do Morro de Gaspar Soares, which, contrary to the general custom in Brazil, is situated on the summit of a high hill. It is surrounded by other hills covered with Capim gordura, which, although it was then the end of the dry season, was quite green, and presented a great contrast to the pastures of Ceará, Piauhy, and Goyaz, which in the same season are quite burned up. Here there was no sign of cultivation, although I was informed that at one time, the whole of these bare Campos were under culture, till the Capim gordura took possession of them; new plantations have been formed at a distance by the cutting down of the virgin forests, which in time, will have to be abandoned from the same cause. Notwithstanding the richness of these pastures, but few cattle were to be seen grazing here. As we did not intend to stop at this village, and as the road passes along the foot of the hill on which it stands, I had not an opportunity of seeing it more closely, but it had a neat and picturesque appearance at a distance. On the road not far from each other, we passed two small iron works; these forges were established by government, while Brazil was still a colony of Portugal, and the greater part of the iron they produced, was sent to the Diamond district for the use

of the mines there; they are now in the hands of private individuals. About two leagues beyond this village, we finished our day's journey at a Venda called Ponte Alta, which has a public Rancho attached to it. The country through which we passed, was not very interesting to the botanist; by the side of a little rivulet, near the Rancho, grew a fine species of *Vochysia*, covered with its long spikes of bright yellow flowers, and a *Rubus*, the fruit of which, when ripe, is green, and has somewhat the flavour of the strawberry.

From Ponte Alta, a journey of three leagues brought us to the Arraial de Itambé; the road led through a hilly but rather well wooded country, with a more varied, general vegetation than any part I had passed over since leaving the Diamond district. About a league and a half from Itambé, we ascended a hill of considerable height, and after journeying about half a mile through a low wood, we entered on an open tract, with a moist sandy soil, which afforded me a large collection of very rare and interesting plants.

The Arraial de Itambé is situated in a beautiful valley, on the banks of a small river which bears the same name, and which we crossed before entering the village, over an excellent wooden bridge. The village contains from eighty to a hundred houses, and a church, most of which are in a state of great decay; indeed, the aspect of ruin and desolation was more apparent here, than in any place of its size I have seen in Brazil, with the exception, perhaps, of the Villa de Parnagoá, in the south of the province of Piauhy; the appearance of the inhabitants was equally abject, and miserable. The valley in which

it stands, is surrounded by high gently sloping hills, some of which are grassy and rocky, while others are covered with low woods. Beyond these hills, and about a league distant from the village, in a westerly direction, a higher chain of mountains exists, called Itacolumi; from the seven summits it presents, it also bears the name of Sete Pecados Mortaes; this range was once covered by forests, which about forty years ago were accidently destroyed by fire. As at the Arraial do Morro, the neighbourhood of Itambé presents no signs of cultivation, if a few small gardens attached to some of the houses, containing some orange and other fruit trees, be excepted. Formerly gold washing was carried on to some extent, in the bed of the river, but it is now found in such small quantities, that the produce will not pay the expense of the labour.

From Itambé, we went to a little hamlet, consisting of about a dozen houses, and a small chapel, called Onça, the distance being about two leagues and a half. The ascent of the Serra from Itambé, was very rocky, and the country afterwards hilly. One of the few plants which I met with on this journey, was the really beautiful *Mutisia campanulata*, Less., a climber with pea-like leaves, and large heads of bright scarlet flowers, which are gracefully suspended on long footstalks.

Our next journey was very long, being a double day's march, or about six leagues. The road led through an open, undulating, and very rich country; and we passed some large Fazendas, surrounded by extensive plantations of Indian corn; those parts of the country not under cultivation, were covered with virgin forests, in which I observed, for the first time since I had left the Organ

Mountains, abundance of the Brazilian cabbage-palm (*Euterpe edulis*, Mart.). The sun was excessively hot all day, and there was scarcely a breath of wind stirring; in consequence of this, I suffered much from a severe attack of head-ache. The place we stopped at, is called Ponte do Machado, where there is an excellent Rancho; the night was clear and cold, and when the men went out in the morning to collect the mules, the grass was covered with hoar frost; and the dew which had fallen on the leaves of the shrubs during the early part of the night, was formed into small icicles; this was the only time I observed ice in Brazil, and the first time in their lives that my men had seen it.

From Ponte do Machado, a short journey of two leagues, brought us to the Arraial de Cocaes early in the forenoon, where we took up our quarters as usual in the public Rancho, the village not affording better accommodation. Long before we arrived at this place, I had been informed that an English mining company possessed an establishment in the neighbourhood; and I now learned that it was situated on a high Serra, which bears the same name as the Arraial, and only about a quarter of a league distant. My stock of money was very nearly exhausted, and, as I should have to pay my Tropeiro on our arrival at the city of Ouro Preto, from which we were now only eleven leagues distant, I determined to apply to the chief commissioner of the Cocaes mine for some assistance. From Natividade, in the province of Goyaz, I had written to the house of Messrs. Harrison, & Co., at Rio de Janeiro, who kindly acted as my agents, during the whole time of my residence in Brazil, re-

questing them to forward all my letters and parcels to Mr. Herring the chief commissioner of the San João d'El Rey mining company, and once at that place, I felt certain that all my wants would be supplied, as Mr. Herring knew me personally, having had the pleasure of meeting him in Rio, in the beginning of 1837; but we were still about thirty-six leagues distant from the town of San João d'El Rey, at which place, it was then my impression, Mr. Herring resided. Coming as I did from the 'far west' of Brazil, I had, of course, no letters of recommendation to Mr. Goodair, the chief commissioner of the Cocaes mines, yet I resolved to solicit from him that aid which a countryman of my own could only be expected to supply.

As soon as my luggage was all properly arranged in the Rancho, I rode up to the mine, but found that Mr. Goodair was out visiting some of the works at a distance, and was not expected to return for two hours, I therefore determined to await his arrival; and in the meantime, I was invited to dine with Mr. Roscoe, one of the officers of the establishment; this gentleman, who is married to an English lady, had a fine family of several little flaxen-haired children, and they, and the dinner, which consisted principally of roast beef and English potatoes, made me feel as if suddenly transported to my own country. Shortly after dinner Mr. Goodair arrived, and after stating to him the object of my long journey, I candidly informed him of the unpleasant circumstances in which I was placed for want of money, and asked him for the loan of 25*l.*, for which I would give him an order on my agents in Rio; by doing so, I told him he would

confer an obligation, not only on me, but on those under whose patronage I was travelling; at the same time, offering to show him credentials, which I purposely took with me, to prove that I was not an impostor. These, however, he would not look at, told me he was sorry that he could do nothing for me, but added, that as my agents in Rio were also the agents for the Morro Velho mining company, perhaps, I might meet with some assistance there: "at all events," he concluded, "the doctor there is a countryman of your own, a Scotchman, and he, perhaps, may feel inclined to do something for you." After giving me this advice, he turned on his heel, and, without even bidding me good day, walked out of the room.

As may well be imagined, my feelings were not a little hurt at this uncourteous treatment; it was quite optional on his part, whether he would let me have the money or not, but I certainly expected a kinder reception. I looked back on my long and painful journey, of more than two years duration, and my memory recalled the many acts of kindness I had received from people of the country, who had never heard of me before, and I felt keenly the marked contempt with which I was treated by an Englishman, and the only one too, to whose benevolence I appealed during the whole course of my travels; my personal appearance might, perhaps, have influenced him, for the necessarily limited wardrobe with which I started from the coast, was now nearly exhausted; nor would the state of my funds allow me to add to it. I was deeply sunburnt, from exposure, and the fatigues of long continued travelling, innutritious diet, and latterly even little of that, together with much anxiety of mind,

produced by the evil which I here tried in vain to remedy, gave me, I have no doubt, no very prepossessing appearance; had Mr. Goodair, however, been of an obliging disposition, a little enquiry would have satisfied him that my object was not to deceive; the fact of my having arrived in the village with four attendants, and nearly twenty mules load of luggage, and the excellent credentials I possessed, carried with them sufficient evidence that this was not the case.

Learning from Mr. Roscoe, and Mr. Rigby, another officer of the establishment, from whom I received much civility, that Mr. Herring was chief commissioner of the Morro Velho mine, which was only about eleven leagues distant from Cocaes, I instantly determined to go and ascertain if any letters had been sent up for me from Rio de Janeiro. I expected to have been able to examine the geological nature of the mine, but the reception I met with put a stop at once to my intentions; Mr. Rigby, however, showed me over the surface works.

The mine is situated near the top of the eastern side of the Serra de Cocaes. In the year 1833, a lease for fifty years was bought by the present company; the former proprietors had worked it previously for a long period, with much profit; in June 1834, the company began operations, and though these have been carried on with much perseverance, and at a great yearly expenditure, but very little gold has been extracted. At the time of my visit, the money laid out on the mine, altogether, exceeded £200,000. The manner in which the mine was worked, formed a great contrast to that I had previously seen adopted by the Brazilians; all the machinery was

put in action by water power and it was a most interesting sight to observe, how one very small stream of water, brought from a distance of several leagues, was turned to so many useful purposes. In the first place it was made use of to drive a saw mill, then descended to the mill where Indian corn for the slaves was ground into flour, thence it was conducted to the blacksmith's shop, to work the blast for a furnace, and the tilt hammer, after this it was led into a large vegetable garden, for the purposes of irrigation, and thence conducted to work a machine, for drawing ore from the mine. Leaving this it descended to drive a large pumping wheel, forty feet in diameter, besides this it kept in action two stamping machines, for reducing the ore to powder, another machine for raising ore, a second forty feet pumping wheel, and lastly, it turned a wheel that worked a machine for ventilating the mine. The gold is found in a soft friable grayish coloured micaceous iron schist, which is called by the Brazilians Jacotinga; the principal shaft is about fifty fathoms deep. At the time of my visit, there were thirty English miners, about three hundred slaves, and thirty hired free Brazilians, at work in and about the mine.

The Village of Cocaes is not only the prettiest I have seen in Minas, but is also the most beautifully situated; it is built on the gentle slope and summit of a low hill that stands in the bosom of a semicircle formed by the Serra, which, in some places is covered with virgin forest, and in others is bare and rocky. Between the Serra and the village, runs the Una, a small stream, which, however, in the dry season contains but little

water. Every where along its banks, and even to a considerable distance, the ground has been turned over and washed for gold; these operations are still carried on. Far from exhibiting the ruin and decay, which the other villages we shortly before passed through presented, the houses here have all a neat appearance, being mostly whitewashed, and surrounded by little gardens containing orange and coffee trees, bananas &c. The church stands out conspicuously from all the other buildings, and around it are planted a few tall palms, which give to the whole place a truly tropical aspect.

On the morning of the second day after our arrival, we left the Arraial de Cocaes; and I thought it very hard to be travelling in the famous El Dorado, with scarcely a sixpence in my pocket, while judging from my first attempt, there were but faint expectations of improving my pecuniary wants. Ascending the Serra de Cocaes by an excellent road, and passing the entrance to the mine, we descended to the other side, and following a nearly westerly route for about the distance of four leagues, along the base of the Serra, reached the celebrated Gongo Soco mine, about two o'clock in the afternoon. About half way we passed through the Arraial de San João do Morro Grande, which consists principally of one long narrow street. The country around it, is formed of a coarse ferruginous soil, that every where has been turned up in search of gold, but as it is now nearly exhausted, very few of the inhabitants are engaged in that species of labour. Like most other villages, that owe their origin to the auriferous soil in their neighbourhood, it presents all the symptom of decadence; houses

that were built in times of prosperity, are quickly falling into ruin, and the few that have been more recently erected, are of a much inferior construction; near the centre of the Arraial is a fine church, still kept in good repair. On the road, several English miners passed us on their way to Rio, from a mine which had been established a few years before, on the Serra de Candonga, between Tapanhuacanga and Cidade do Serro, but which was now about to be abandoned.

As I brought a letter with me from Mr. Rigby at Cocaes to Mr. T. Baird, one of the partners of a large general store at Gongo Soco, and as I was most kindly received by him, I found myself more comfortably situated than at Cocaes. The whole of the houses at this place belong to the company, and it is undoubtedly one of the prettiest little villages in the province. The situation in which it is placed, adds much to its beauty, being a narrow valley, bounded on the north by the high wooded Serra, that runs westward from Cocaes, and by a lower undulating grassy elevation on the south; with the exception of the large house occupied by Mr. Duval, the chief commissioner, the others are all of one story, arranged in streets, isolated, and in the English cottage style, adorned in front with flower beds, and not unfrequently with palms and other tropical trees. Near the centre of the village, stands a small but elegant church, for the use of the free Brazilian workmen and slaves, employed by the company. There is a catholic priest in the pay of the company, and formerly, there used to be an English clergyman also; in this village the officers and the greater part of the English miners reside. The

mining operations are carried on about half a mile further to the westward; and the houses of the slaves are situated near the works.

By Mr. Hammond, the acting chief commissioner, Mr. Duval being then on a visit to Rio, and by the other officers, I was kindly welcomed to the establishment; and to one gentleman in particular, I shall ever feel grateful for his disinterested kindness, and more so from his being a foreigner, I mean Mr. Virgil Von Helmreichen, the civil engineer of the establishment. Having entered into conversation with me on the nature of my travels and pursuits, he told me that he was well acquainted with Mr. Natterer the celebrated zoological traveller in Brazil, who had often mentioned to him the awkward situations, in which he had frequently been placed, when in the interior, from the want of opportunity to draw for money; and his knowledge of this fact led him to enquire into the state of my funds, which I candidly explained to him, when he very generously offered to let me have as much money as would convey me to Rio, on no other security than my promise to pay it into the hands of his agent on my arrival there. This obliging offer I, however, declined to accept, until I could ascertain at Morro Velho whether my letters had arrived there or not.

Having expressed a wish to Mr. Hammond to be allowed to visit the interior of the mine, he at once kindly consented, and requested one of the mining Captains to escort me: Mr Ferriar a young gentleman whom I had formerly met at Rio, offered to accompany me. Before going down, we were taken to the room

where the Captains keep their mining clothes, and were there obliged to change our dress for one of the suits used in the mines. This consisted of a large coarse flannel shirt, a pair of drawers of the same material, and a coat and trowsers made of coarse canvas, a stout leathern hat, which fitted the head tightly, and a pair of strong shoes, which we put on our bare feet. Being thus accoutred, we were each provided with two candles, one which was for immediate use, was stuck into a ball of soft clay which served as a candlestick, and the other hung to the button of the coat for after use. Fitted out in this manner, we entered the mine by what is called the Adit level, whence we descended to the next level, seven fathoms deeper; and so on in succession, till we visited seven out of the nine levels, or workings, of which the mine consists; as the two lowest were full of water we could not visit them. The distance between each of the levels, is seven fathoms, so that we reached the depth of 294 feet, while the greatest depth is about 378. The excavations in these levels consist of narrow passages or galleries, not more than four or five feet wide, and five or six in height, driven in various directions through the Jacotinga, or micaceous iron Schist. This Schist is of so soft a nature, that the passages as they are driven, require to be strongly lined with wood to prevent their filling up again; and in many places, it is quite astonishing to see how some of the thick pillars of hard Brazilian wood, often a foot and a half in diameter, are crushed and broken by the weight from above. The principal gold vein, runs to the westward, but there are many ramifying branches; the vein is very unequal in richness, some-

times, as at the period of my visit, yielding hardly any gold, while at others it is found in what the miners call bunches, which are sometimes so rich, that more than one hundred pounds weight of the pure metal has been taken out in one day. The rich ore is washed and pounded up in mortars, while the poorer sort is sent to the stamping mills, and afterwards either separated by washing in the Bateia, or amalgamated. Notwithstanding the superior richness of this mine, the machinery appeared much inferior to that at Cocaes.

From an excellent diagram constructed by Mr. Helmreichen, exhibiting a section of the country in which the mine is situated, and which he kindly allowed me to examine, I have been enabled to make the following sketch of its geological structure. The Serra which runs from east to west, and lies to the north of the mine, is of primitive character, the mass of its centre consisting of granite; upon the granite is imposed a thick bed of schistose and clay slates, cropping out at an angle of about 45°. Above this lies another thick bed of ferruginous Itacolumite, having the same inclination as the rocks below; and immediately over this the Jacotinga, or soft micaceous iron schist, which contains the gold, and which is about fifty fathoms in thickness. Above the Jacotinga is another thick layer of Itacolumite; and lastly about half a mile to the south of the mine, a thick bed of a highly crystallized stratified limestone crops out at the same angle, and in the same direction as the other rocks. About half a mile to the eastward of the entrance to the mine, the bed of Jacotinga narrows to a point, but towards the westward it appears to be inexhaustible,

and in that direction all further mining operations will be carried on.

On the morning of the 29th of August, I left Gongo Soco to visit the Morro Velho mine, which is distant about six leagues in a N.W. direction. I was accompanied only by a guide, having left all my men and luggage at Gongo, as I expected to be absent only about three days. The country between the two places is very hilly, and barren, consisting of elevated grassy hills occasionally studded with a few small trees. In the hollows, however, there are generally patches of trees, forming those woods to which the name of Capões is given. About two leagues and a half from Gongo, we passed through a small straggling village called Morro Vermelho, which was in a state of great decay; and about two leagues and a half further on, a still smaller village called Rapoza, situated on the banks of the Rio das Velhas; we crossed this river over an old narrow, tottering, wooden bridge, without rails. On my arrival at Morro Velho about eight o'clock in the afternoon, I found to my great delight, that all my English letters and parcels, which had been accumulating during more than two years, were here awaiting my arrival, which had been expected several months. Letters of credit had also been kindly sent up by Messrs. Harrison, for such sums of money as might be required by me, so that my mind was now quite at ease on that point. I sat up nearly all night reading my letters, but the state of mind produced by them was far from happy, for not a few of them brought most unwelcome news, of the death of near and dear relations and friends. The kind reception I met

with from Mrs. Herring, the lady of the chief commissioner, and from Mr. Crickitt, the acting commissioner for Mr. Herring, who was then in Rio with his two eldest daughters, will ever be remembered by me, with the warmest gratitude. Rooms were ready to receive me, and instead of remaining only one day as I originally intended, I was prevailed on to spend about a month at Morro Velho, during which time, my health improved rapidly. The day after my arrival, I sent to Gongo Soco for Mr. Walker, the men, and the luggage.

The mine of Morro Velho, is situated about half a mile to the S.E. of the Arraial de Congonhas de Sabará. The village which is very irregularly built, is placed in a hollow, and contains a population of about 2,000 inhabitants; but until the mines in the neighbourhood began to be worked by the English, the population was much less; here are three churches, one of which has never been finished, and is now falling into a state of ruin. The mine is situated on one of the hills surrounding the valley, and had been worked by its proprietors for about a hundred years previous to its being bought by the present company. When St Hilaire visited this village the gold was considered as exhausted,* but it now yields, perhaps more gold than any other mine in the empire. The present company first commenced its operations about 1830, under the superintendence of Captain Lyon,

* "Congonhas doit sa fondation à des mineurs attirés par l'or que l'on trouvait dans les alentours, et son histoire est celle de tant d'autres bourgades. Le precieux métal s'est épuisé; les travaux sont devenus plus difficiles, et Congonhas n'annonce actuellement que la décadence et l'abandon"—*Voyage dans le District des Diamans &c. par Aug. de St. Hilaire*; vol. 1. p. 169.

the northern voyager. This mine is very different from that at Gongo Soco, inasmuch as the auriferous vein occurs in a grayish coloured clay slate; the vein, or lode itself, consisting of a kind of quartzose rock mixed with a considerable proportion of carbonate of lime, strongly impregnated with iron and arsenical and copper pyrites; its general direction is from east to west, and it is about seven fathoms wide a little to the west of the central workings, at which point it divides into two branches that run to the westward, while other two extend to the eastward; the more easterly branches are those that have been worked to the greatest extent. These ramifications gradually diverge, and ultimately take a N.E. direction, running parallel to each other, at a distance of about a hundred feet.

The ore is first removed from its bed by blasting, and is afterwards broken by female slaves into small pieces, about the size of the stones put upon macadamized roads, after which it is conveyed to the stamping machine to be reduced to powder; this machine consists of a number of perpendicular shafts placed in a row, and heavily loaded below with large blocks of iron; these being alternately lifted up to a certain height by a toothed cylinder, turned by a large water-wheel, fall down upon, and crush the stones to powder; a small stream of water constantly made to run through them, carries away the pulverized matter to what is called the strakes, a wooden platform, slightly inclined, and divided into a number of very shallow compartments, of fourteen inches in width, the length being about twenty-six feet; the floor of each of these compartments is covered with pieces of tanned hide

about three feet long, and sixteen inches wide, which have the hair on; the particles of gold are deposited among the hairs, while the earthy matter, being lighter, is washed away. The greater part of the gold dust is collected on the three upper, or head skins, which are changed every four hours, while the lower skins are changed every six or eight hours, according to the richness of the ore. The sand which is washed from the head skins, is collected together and amalgamated with quicksilver in barrels, while that from the lower skins is conveyed to the washing-house, and concentrated over strakes of similar construction to those of the stamping mill, till it be rich enough to be amalgamated with that from the head skins. The barrels into which this rich sand is put together with the quicksilver, are turned by water, and the process of amalgamation is generally completed in the course of forty-eight hours; when taken out, the amalgam is separated from the sand by washing, it is then pressed in chamois skins, and the quicksilver is separated from the gold by sublimation. In the whole process, the loss of mercury amounts to about thirty-five pounds a month, but up to two months before my visit, it was nearly double that quantity. For a long time the gold dust was extracted from the sand by hand-washing in Bateias, after the Brazilian manner; but the process of amalgamation is found to be superior, requiring less labour, and extracting a larger proportion of gold. The zillerthal, or running amalgamation process, similar to that used in the Tyrol, has also been tried here, but was not found to answer, owing to the great loss of quicksilver. The roasting process has also been attempted, but although by this

means the ore yields a much larger per-centage of gold, the fumes arising from the arsenic were found to be so injurious to the health of the workmen, that it was abandoned. A ton of ore produces from three to four Portuguese oitavas of gold; but the same quantity has often yielded as much as seven oitavas. At the time of my visit, from fifteen to sixteen hundred tons of ore were reduced to powder every month.

After having rested about a week at Morro Velho, I started, with Mr. Monach, the surgeon to the company, to ascend the Serra de Piedade, which is the highest part of the great western chain in the Gold district. After travelling about three leagues in a northerly direction, we arrived at the city of Sabará, which, except the Cidade Diamantina, was the largest I had then seen in the interior; it is situated on the north bank of the Rio das Velhas, at the eastern foot of the great chain already alluded to. From the place where the first view of it is obtained, it has a very fine appearance, its site being somewhat elevated, the houses are generally large, and there are several fine churches; the old and new city together, are about a mile in length, but the breadth is inconsiderable; the streets are generally wide, and well paved, and judging from the numerous public fountains, it appears to be well supplied with water. It was only about two years before the period of my visit, that Sabará was raised to the dignity of a city; the greater part of the inhabitants are shopkeepers, who trade with those of the Sertão to the westward. Notwithstanding its near approach in size to the Cidade Diamantina, it forms a great contrast with it in the stillness of its streets. The

ferruginous gravelly soil around it, and along the banks of the river, has all been turned over in search of gold, but now very few seem to be engaged in that pursuit; the bed of the river is said to be rich in gold dust.

From Sabará we went to Cuiabá, a mining establishment belonging to the Cocaes Company, about two leagues distant; the road for nearly the whole way runs up a narrow and very picturesque valley, along the banks of a small river. At the Cuiabá mine there were only two officers, Mr. Richards, the superintendent, and Dr. Morson, the surgeon, who is married to an English lady, by whom we were kindly received. The Serra de Piedade being still about two leagues and a half distant, we slept that night at Cuiabá, and started next morning about half past six o'clock, accompanied by Mr. Richards. After crossing the small river which passes the mine, we almost immediately began to ascend the high country on the opposite side, and having travelled about two leagues, through a hilly, grassy country, destitute of trees, except in low hollow places, we crossed entirely from the eastern to the western side of the mountain chain, of which the Serra forms part, so as to reach the proper place of ascent; this we gained by skirting along the base of the Serra, but at a considerable elevation above the plain below, through a bushy stony spot. The first half of the way from this place is pretty steep, and leads over a rough hard reddish iron-stone tract, thinly covered with a few bushes of a species of *Baccharis*, and another of *Lychnophora*, while on the grassless stony surface of the ground, there were numerous species of *Orchideæ*, among them a beautiful *Lælia* with yellow flowers, a very

prickly procumbent species of *Cactus*, and numerous large water-bearing *Tillandsias*. Leaving this region we came upon a flat space covered with large blocks of micaceous rocks, the layers of which are very tortuous. The road then winds along the western side of the mountain, close to the edge of some deep precipices, and finally ascends to a level spot, situated but a little way below the highest part of the mountain. On the extreme northern part of this flat there is a small church called Nossa Senhora de Piedade; upon our arrival there, we found a party consisting of half a dozen women and two men, who had reached it a short time before us; we soon learned they had come to fulfil vows which they had made some time before. We saw large offerings of candles they had presented to the church; and most of them had made promises to sweep the floor of the chapel, for we observed that the women in particular, cut small twigs from the bushes in the neighbourhood, of which they made brooms, and with which they, one after the other, swept it, but in no very careful manner. Leaving our horses near the church, we ascended the highest peak, which is of a very rocky nature, and covered with a vegetation of small *Orchideæ* and *Tillandsias*. Ordering the refreshments we had brought with us to this place, we sat down on the rocks to breakfast; according to Spix and Martius, this mountain is 5,400 feet above the level of the sea. While skirting along the lower part of it, we felt very cold, in consequence of being enveloped in a mass of dense clouds which were rolling past us, discharging at the same time enough of their contents to wet us not a little; I never, before

this occasion, saw so distinctly, the vescicles of which clouds are formed. It was not till about eleven o'clock, or nearly two hours after we had reached the summit, that these clouds began to disperse, and then we had a most extensive view of the country on all sides, which is of a very hilly nature, excepting on the west, where the flat Sertão district presents itself. Notwithstanding the magnificence of the view obtained from this point, the pleasure to be derived from overlooking a populous and richly cultivated country was wanting. But few houses came within range of the sight; and the Villa de Santa Luzia, about six leagues distant to the south, is the only town that can be descried, the others being hidden by the surrounding mountains. Two of the most prominent objects that strike the view, are the Serras of Cocaes and Caráça, the latter of which is the highest, and about eight leagues distant in a N.E. direction.

On the eastern side of the mountain, close to the church, there is a small garden, which seems to have been well attended to in better times. I observed there a few stinted peach and apple trees, a few potatoes, and other European vegetables. The greater part of the garden, as well as the top of the Serra, in front of the church, is overrun with the common strawberry of Europe, and being then in fruit, we each obtained a handful. Several other European plants have become naturalized, such as the chickweed, *Cerastium vulgatum*. The church is kept by a middle-aged Mulatto woman, and a dirty-looking old white man, dressed in the habit of a priest, who calls himself a hermit, resides there also. Except the few vegetables which they cultivate, their

food comes all from below, and the water they drink is obtained from the numerous *Tillandsias* which crowd the rocky parts of the Serra, and which in the bases of their leaves, contain a large quantity of water, an ordinary sized plant yielding about a pint.

The Serra is rich in plants interesting to the botanist, but not nearly so much so as the Organ Mountains, in the province of Rio de Janeiro, owing, no doubt, to its great want of moisture. From the upper part, I obtained two fine shrubs belonging to the natural order *Malpighiaceæ*; a fine shrubby *Styraæ*; a *Cassia*, about four feet high, which is very common near the middle of the mountain; a red flowered *Gaylussacia*, and a *Gualtheria*, both abundant near the summit; a shrubby variety of *Drymis Granatensis*, several ferns, and a few mosses and lichens.

Shortly before we began to descend, the atmosphere became so hazy, that we could see only to a short distance; this was caused by the custom that prevails at the end of the dry season of burning the Campos, as this encourages the more speedy growth of a crop of new grass, after the rains have set in; it is also at this season that the wood is burned on the grounds which have been cleared for cultivation. After a very pleasant day's excursion, we reached Cuiabá about dusk, and having spent the greater part of the evening with Dr. Morson and his lady, I was occupied till near midnight in preparing the specimens I brought with me from the Serra. On the following day we returned to Morro Velho, the mine of Cuiabá is very similar in its nature to that at Morro Velho, but wrought on a much smaller scale, and the ore moreover is not nearly so rich. During my stay

at Morro Velho, I made many little excursions in the neighbourhood, and thus added largely to my collections.

On the morning of the 24th of September, after having taken leave of my kind friends at Morro Velho, we again resumed our journey. There is a direct road from this place to the city of Ouro Preto, the capital of the province of Minas, through which I wished to pass, but part of my luggage having been sent on from Cocaes to a village called San Caetano, situated about three leagues below the city of Marianna, I was obliged to proceed there first. It was my intention to return to Gongo Soco by the way I had come, but the day before we left, information reached Morro Velho, that the wooden bridge over the Rio das Velhas, at Rapoza, had fallen down. We were therefore obliged to return by way of Sabará, which increased the journey about two leagues. We passed through Sabará without halting, and arrived in the afternoon at the Cuiabá mine, where we spent the night with Mr. Richards, and started again next morning after breakfast, reaching Gongo Soco between five and six o'clock in the afternoon. Almost the whole of the country between the two places, with the exception of the Serra to the N.W. of Gongo, consists of bare grassy hills, a few small woods only existing in the hollows. Being then the end of the dry season, the hills had a very arid and barren look, everything being burned up from the want of rain. The roads were covered with fine yellow dust, the *debris* of the clay slate of which the hills are formed; and we were nearly the whole way enveloped in a dense cloud of it, rising up from the horses' feet.

At about half way between the two places, we passed through part of the Villa de Caeté, a miserable looking town of some size, situated in a narrow shallow valley, running in a N.E. direction from the Serra de Piedade, the Villa itself being distant from it, about two leagues. This Villa, like many others in the mining districts, has all the appearance of having seen better days, as it contains the ruins of many fine houses, as well as one of the finest churches that exists in the interior, and St. Hilaire doubts even if there is one in Rio de Janeiro that may be compared with it.

On the day we left Gongo Soco, we passed through the Arraial de San João do Morro Grande, and halted for the night at a small hamlet called Barra, about a league to the S.E. of it. The country around, as well as the road we had passed over, was hilly, bare, and arid; a small stream passes through the village, the gravelly banks of which have been completely turned over in search of gold. Next day we made a journey of about two leagues; and about half a league from Barra, we passed through the Arraial do Brumado, a long straggling village in a state of great decay. Leaving this place, we continued in an easterly direction till we arrived at the foot of the Serra de Caráça, and winding along the hilly base of its N.E. side, we reached, shortly after mid-day, the Arraial de Catas Altas, which is situated at the foot of the Serra towards its S.E. extremity. It consists principally of one long street, and like Brumado does not seem to be in a very flourishing condition. The hills around the village, and between it and Brumado, are covered with Capim gordura. At a considerable elevation

on the Serra itself, there is a hermitage, called Nossa Senhora Mai dos Homens. The building was begun by a Portuguese in 1771, who was still alive, though above a century old, when it was visited by Spix and Martius in 1818; it is now converted into a theological seminary, but is said to contain but few pupils. This Serra was botanically explored by St. Hilaire, as well as by Spix and Martius, and found to be very rich in rare and curious vegetable productions; I wished also to devote a day to ascend it, but the weather was very unfavourable, as it rained heavily, and the upper parts of the mountain were enveloped in clouds.

Leaving Catas Altas, the road takes a southerly direction, along the foot of the Serra de Caráça; and after travelling about two leagues, we passed through the Arraial de Inficionado, another long, narrow village, about the same size as Catas Altas, and like it, in an obvious state of decadence. About a league further on, we arrived at the Arraial de Bento Rodrigues, where we took up our quarters for the night in the public Rancho. The road, on this journey, was far from good, being both hilly and stony; I saw but little soil fit for plantations, it being generally of a clayey nature, intermixed with a coarse ferruginous gravel, or the *debris* of the schistoze rocks of the Serra; and everywhere this soil has been turned up in search of gold, but with the exception of a small mine between Inficionado and Bento Rodrigues, I saw no appearance of any workings being carried on.

At about a league from Bento Rodrigues, we passed through a small village, called Arraial de Camargos,

which is situated among some hills on the side of a small river. We were now only three leagues from the place of our destination, San Caetano, which I was anxious to reach without further delay, but the road, which here passes through a bare hilly country, is bad, and the mules being only lately broken into work, we got on but very slowly, from their either lying down, or going off the road. On this account it was about five o'clock in the afternoon when we reached the last house on the road to San Caetano, the distance between them being somewhat less than a league. At this house, the Tropeiro wished to remain for the night, a proposal I would by no means consent to, especially as it threatened to rain, and the house was so small, and so badly covered, as to afford but very indifferent shelter. He, however, insisted on remaining, and would have done so, had I not threatened him with non-payment, when very much against his will, he resumed the journey, and about dusk we reached the Arraial de Caetano, where I found all my collections in good condition, in the house of the Tropeiro who brought me from Cidade do Serro, and who again agreed to take me to Rio. In passing through a small forest, not far from the Arraial, I collected specimens of three kinds of tree ferns, and added to my collection of *Orchideæ* a pretty sweet-smelling *Epidendrum*.

The Arraial de San Caetano, which is small, and evidently poor, is situated on the acclivity of a low hill on the north bank of a small stream which empties itself into the Rio Doce. It contains only one church, which if finished on the scale it has been begun, would be a great ornament to the place, standing as it does, on

a height which overlooks the village. Gold washing in the bed of the stream, and along its banks, seems once to have been the chief occupation of its inhabitants, but that source of gain being now exhausted, they have mostly taken to the cultivation of the soil, much of which in the neighbourhood, is well adapted for the growth of coffee, Indian corn, &c.

The Tropeiro not being able to start for some days after my arrival, and making objections to go round by Ouro Preto, which I had a great desire to see, I determined to make a hurried visit to that city alone. I therefore hired a guide, and started on the morning of the 5th. of October. A journey of three leagues through a hilly and thinly wooded country, brought me to the city of Marianna, the situation and appearance of which pleased me very much; it stands on the S.W. side of a broad level valley, on the gentle declivity of a rising ground which skirts the base of the range of the Serra de Itacolumi. It is more compactly built than the towns I have generally seen in Brazil, and as there are several fine and handsome churches, and the houses are mostly large and white-washed, the city has altogether a very noble appearance. In the suburbs, and even in the city itself, many of the houses have gardens attached to them, planted with Bananas, Oranges, and the round-headed Jaboticabeira, which with their different shades of green, contrast well with the white-washed walls of the houses; in passing through the town, it appeared so quiet, that I could almost have fancied it deserted. In some of the principal streets, I saw a few shopkeepers leaning listlessly over their counters, and on the stairs in front

of the prison, a few soldiers keeping guard; these and an occasional black urchin squatted at a door, were all that gave an idea of life in the city, which is said to contain about 5,000 inhabitants. It is more a clerical than a commercial city, being the residence of the Bishop, and the seat of a theological college.

The imperial city of Ouro Preto, formerly Villa Rica is about two leagues distant from Marianna in a south west direction, the road, which is very good, gradually rises towards Ouro Preto. In many places along the side of it, there are planted at irregular distances, wild fig-trees, natives of the country, which have grown up, and not only give a good shade, but recall to a European the roads of his native country. Near the entrance to the city, where the road has been hollowed out of the solid rock, many galleries are to be seen entering the hills; these are gold workings which have been long abandoned, and some of which are now made use of as pig-styes, by the poor people who live in their vicinity. About half way between the two cities, the road passes through the Arraial de Passagem, a small village, the inhabitants of which formerly subsisted by gold washings, but the mines being now exhausted, they occupy themselves with the cultivation of provisions, for which they find a ready market in Ouro Preto.

During my short stay in the Imperial city, I lived in the house of Senhor José Peixoto de Souza, having carried letters to him from Morro Velho. He is the principal merchant in the province of Minas, and possesses the finest house in the city; the erection of it cost him about £4,000 sterling, a great sum for a house in the

interior of Brazil. He is a man of a very kind and obliging disposition, and being agent for all the English mining companies, his house is the place where the officers belonging to them, put up at in passing through the city, there being no respectable inn in the whole place; nor is it only Englishmen who make his house a rendezvous, his own countrymen sharing in like manner his hospitality. During the three days I remained there, so many guests arrived and departed, that it had more the appearance of an inn, than the dwelling of a private individual. He began life as a simple washer of gold (faiscador), and is now the principal gold merchant in the province.

The country around the city is hilly in the extreme, and the rocks consist of clay-slates, soft micaceous iron schist, commonly called Jacutinga, and that hard iron slate rock, now known by the name of Itacolumite, all disposed in layers that are much inclined; the country round is auriferous, and many workings exist in the neighbourhood. In the narrow valley, on one side of which the city stands, runs a small stream, called the Riberão de Ouro Preto, which takes its rise in the neighbourhood; the bed of this brook consists of a soft kind of gravel, and in it the poorer part of the inhabitants gain a scanty subsistence by washing for gold. The operation is called Mergular, or diving, and the people who work in this manner are called faiscadores; they are generally half naked, and after raking away the larger stones from the place, which they select in the bed of the stream, they fill their flat wooden plate (Bateia), with the fine gravel and sand, which is purified by washing in a

peculiar manner, till at last the gold dust remains in the the bottom of the vessel, from which it is transfered to a small leathern bag which is suspended from their middle; they are not able to make more than about a shilling a day. The time they prefer is after heavy rains have caused a strong current in the stream.

Although the city of Ouro Preto is much larger than that of Marianna, it has not the same imposing appearance, not for the want of large buildings, but from the irregularity of its site. The greater part of it is built upon the side of the Serra de San Sebastião, which forms the N.W. boundary of a deep narrow valley. It is naturally divided into an upper and a lower town, the upper being by far the finer; it contains a number of handsome buildings, such as the palace of the provincial government, which is a large and well built stone edifice, standing on one side of a square of considerable size, the opposite side of which is formed by the town house and prison, which is also a fine building. A little below these stand the barracks, which are the best I have seen in the interior; the treasury is also a good substantial stone building, but the low situation, and the narrow street in which it is built, does not allow of its being seen to advantage. The city contains six large churches, the finest of which, Nossa Senhora do Carmo, stands in the upper town, not far from the prison house; the city is abundantly supplied with water of an excellent quality, a fountain existing in almost every street.

The population of the city is said to amount to about 8,000 souls; it contains many good shops, but not one devoted to the sale of books. It boasts, however of two

printing offices, and four newspapers, two of which are ministerial, and two belong to the opposition. They are of a small folio size, and their contents are almost entirely of a political nature. In the begining of the year 1840, a college, a preparatory one, was established by a law passed in the provincial assembly, in which Latin, French, English, Philosophy, Mathematics, and Pharmacy, are taught by as many different Professors.

About a mile from the city there is a Botanic Garden, which is maintained by government, and principally intended for the propagation of useful exotic plants, to be given gratis to those who may apply for them. I found the plants principally cultivated here, to be the Tea plant, Cinnamon, the Jaca, Breadfruit Mango, &c. Several acres are devoted to the cultivation of tea, of which a considerable quantity is manufactured yearly, and sold in the city at about the same price as that which is imported from China. The avenue leading to the garden, as well as several others which surround it, are planted with the Brazilian pine (*Araucaria Brasiliana*), which adds greatly to the beauty of the grounds; these trees were about thirty years of age, and bore abundance of their large cones yearly.

CHAPTER XIV.

OURO PRETO TO RIO DE JANEIRO, AND SECOND JOURNEY TO THE ORGAN MOUNTAINS.

Leaves Ouro Preto—Arrives at San Caetano—Passes Arraial de Pinheiro—Piranga—Filippe Alvez—San Caetano—Pozo Alegre—Sadly incommoded by a thunder-storm—Reaches Arraial das Mercês Chapeo d'Uva—Entre os Morros—Crosses Rio Parahybuna—And enters the Province of Rio de Janeiro—Passes Paiol—Reaches Villa de Parahyba—Crosses the River Parahyba—Mode of Ferrying described—Passes Padre Correa—Corrego Seco—Reaches summit Pass of the Serra d'Estrella—Magnificent view of the Metropolitan City, its Harbour, and surrounding scenery—Arrives at Porto d'Estrella—Embarks for the City and finally arrives at Rio de Janeiro—All the Collections brought from the Interior, are arranged and shipped to England—The author resolves again to visit the Organ Mountains—His departure for the Serra—Adds largely to his Collections—Ascends the loftiest peaks of the Mountains—Their elevation above the sea about 7,500 feet—Departs on an excursion to the Interior—Passes the Serra do Capim—Monte Caffé—Santa Eliza—Sapucaya—Porto d'Anta—Crosses Rio Parahyba—Passes Barro do Lourical—San José—Porto da Cunha—Recrosses the Rio Parahyba—Reaches Cantagallo—Visits Novo Friburgo—Description of these two Swiss Colonies—Pleasant sojourn in the Organ Mountains.

Two days after my return from the city of Ouro Preto, we left the village of San Caetano for Rio de Janeiro, and having travelled in a S.E. direction about two leagues and a half, we halted for the night in a public Rancho near a small Fazenda. It rained heavily nearly all the way, and there was much thunder; our road was

through a hilly country, the hollows only being thickly wooded; in marshy spots I observed some fine large *Talauma* trees, which are the *Magnolias* of South America, and whose large blossoms are equally fragrant. The rain continued all night, but towards morning the weather cleared up and allowed us to resume our journey. Besides the mules that were employed to carry my luggage, the Tropeiro had many others loaded with coffee, an article which is now cultivated to a considerable extent in the province of Minas. Another journey of three leagues and a half, through a hilly, well wooded, and rather thickly inhabited country, brought us to the Arraial do Pinheiro, a small village surrounded by Gold washings, which, however, are upon a very small scale. In the Rancho, in which we passed the night, there were two other large troops, one of which was conveying coffee to Rio and the other on its way thence with salt for the interior. The woods through which we passed, reminded me very much of those on the Organ Mountains, not only from their general appearance, but from the great similarity in the vegetation. Three or four beautiful kinds of tree-ferns, often reaching to the height of from thirty to forty feet, grew in humid shady places; and on the more elevated tracts, were seen many large trees of an arboreous *Vernonia*, upwards of forty feet high, covered with large panicles of white flowers, which, along with the blossoms of a large *Myrcia*, perfumed the air with their rich odour.

Still following a S.E. direction, we reached the Arraial de Piranga, which is about three leagues distant from the village of Pinheiro; this Arraial, like many others we

had passed before, owed its origin to the gold which existed in the soil of this neighbourhood; at one time great quantities were found here, but the workings are now nearly exhausted. The population consists of about 1,200 persons, most of whom are in great poverty; it has a dull and deserted appearance, but at the same time all the indications of former opulence; it contains three churches, and the greater part of the houses are large, and generally of two stories, a mode of construction not very common in the villages of Brazil; many of the inhabitants are now following agricultural pursuits. Our next day's journey of about four leagues, through a country similar to that we had just left behind, but more thinly wooded, brought us to a large Fazenda, called Filippe Alvez. We were allowed to pass the night in the sugar mill, a large building open nearly all round; the mill was worked by a water wheel about thirty feet in diameter, which at times was also used to put in motion a machine for pounding Indian corn; the latter which was at work both by day and night, annoyed us not a little by its noise. Large tracts of land near the house had lately been planted with Indian corn and rice.

From Filippe Alvez, we went on to a small village called the Arraial de San Caetano, the distance being about three leagues. It is a small and miserable place, and although it contains a few shops, I could find no provisions to purchase, excepting farinha made from Indian corn. On this journey, I found a fine large species of *Equisetum*, the largest indeed that has yet been seen in the recent state; it grew abundantly in a wooded marsh near the road, and I measured one that was upwards of

fifteen feet in height, the lower part of the stem being full three inches in circumference. Although of gigantic size, when compared with the other species existing at present on the earth's surface, it is far from equalling those enormous remains, which are found in the fossil state in the coal strata, and known to geologists under the name of *Calamites*; many of these have stems as thick as a man's body; indeed the difference in size between the recent species of *Equisetum*, and those which have existed at a former period of the earth's history, is about as great as between a stem of wheat, and the gigantic bamboos of the East Indies and of South America.

We travelled on the following day about three leagues, through a hilly country, which in some places was well wooded, but the greater part of it consisted of large cleared tracts which had formerly been under cultivation, but were now every where covered with the large brake I have before mentioned; this fern is not, however, entirely without use, for the young shoots cut into small pieces and boiled, or stewed with pork, are eaten by the inhabitants, and are said to be not only pleasant to the taste, but wholesome. We took up our quarters for the night in a large open Rancho, near a Fazenda called Pozo Alegre.

At this place we spent a most miserable night; about midnight we were awakened by a dreadful tempest of thunder, wind, and rain, which came from the westward. The Rancho, was open all round, and the end that faced the storm, was unfortunately that where Mr. Walker and I had slung our hammocks. When I awoke, a loud peal of thunder was rolling fearfully right over

us; my hammock was swinging to and fro by the force of the wind, which was blowing a hurricane, and we were soon completely drenched by the rain, which fell upon us in streams from the roof. My greatest dread was that the old shed would be blown down upon us, but it fortunately withstood the blast; my collection of botanical specimens suffered very much, as the boxes in which they were packed, were arranged in the middle of the floor, and this being considerably lower than the sides, it soon filled with water to the depth of six inches; in consequence of this, the parcels in the bottoms of four of the boxes were greatly damaged. The storm lasted for an hour with undiminished force, and as soon as it abated we struck a light, for our fire had been completely extinguished; the water was quickly bailed out of the shed, and the boxes raised from the ground; a fire was kindled with some difficulty, around which we all crowded, for we were suffering much from the cold; it now became a question how we were to sleep, during the remainder of the night, as every thing available for a bed was thoroughly wet. For my own part I arranged some pieces of wood, that had been brought in the evening before for fuel, alongside the fire, and although the bed thus formed was not a very soft one, I contrived to pass the night tolerably well.

The next morning being still cloudy, without any probability of the appearance of the sun, I sent to the owner of the Rancho to ask permission to dry my plants in the Mandiocca stove; and, as he returned word that I might do so, we had everything taken there in a short time. On our arrival at the house, he seemed to have

changed his mind, from what cause I know not, for he told me very plainly that we might go somewhere else, as he would not allow us to enter his premises; I have seldom been so much annoyed as I was at this conduct. This man, whose name was Major Domingos Josè de Barros, was about eighty years of age, a Portuguese by birth, and said to be worth upwards of a hundred thousand crusados; he was of a most miserly disposition, as indeed his whole appearance testified, his dress being old and of the coarsest materials.

We went on about half a league further, to a Fazenda belonging to a son-in-law of the old miser, who was also a Portuguese, but altogether different in disposition. He immediately gave me accommodation for my luggage, and the sun shining out brightly shortly after our arrival, we lost no time in spreading out the collections that had been wetted the previous night. We were again visited by a thunder-storm in the afternoon, which prevented us from getting more than half of them dried. At this Fazenda, where I received much hospitality, I remained the whole of the following day to complete the drying and packing of my collection, and next morning, a journey of about three leagues brought us to the Arraial das Mercês, a village which consists of a single street about a quarter of a mile in length. In a large square in the middle of it, are a few good houses of two stories, and the only church; this last is built of large unburned bricks, and being unplastered, has a very mean appearance when contrasted with the white-washed houses by which it is surrounded. The whole village has a much greater appearance of prosperity than any we had passed on the

road from Marianna, the reason is obvious, the non-existence of gold in its vicinity. The country during this day's journey was still hilly, and covered with virgin forests. We passed several Fazendas, the houses of which were very ill-built and dirty, and very different from what I expected to find in this part of Brazil. Near these houses large tracts of forests had lately been cut down and burned, and the ground so cleared, planted with Indian corn, which is the staple article of food in the southern, as Mandiocca is in the northern provinces.

During the four following days, we accomplished about fourteen leagues, and arrived at Chapeo d'Uva, at which place, the road by which we came, called the Caminho do Mato, or forest road, joins that of the ordinary traffic which passes through the city of Barbacena, and the Campo district between it and the capital of Minas. Our route, on these journeys, was still through a hilly country, and the roads were extremely bad, passing for the most part through virgin forests, the trees of which, in some places, were very large, consisting principally of different kinds of *Cecropia, Vochysia, Copaifera, Laurus, Ficus, Eugenia, Myrcia,* and *Pleroma.* I also observed many kinds of tree-ferns and Palms, the most abundant of the latter tribe being the slender cabbage palm, (*Euterpe edulis,* Mart.), several of which we cut down for the sake of the long terminal bud, which when cooked, is equal to asparagus in flavour. At Chapeo d'Uva we slept as usual in a public Rancho, and from this place we made a journey of about three leagues, and halted at a large Rancho near the village of Entre os Morros. The road was excellent, being part of the new line, then in course of construction,

from Rio to Ouro Preto by way of Barbacena. About two leagues and a half from Chapeo d'Uva, we passed the first toll-bar I met with on a highway in Brazil: all animals, whether loaded or unloaded, pay here thirty reis a league, which is the sum also charged for foot-passengers. The distance hence to the next toll-bar is ten leagues, and the whole amount has to be paid here for the distance to the next bar, which was then the termination of the finished part of the road. The legislative assembly passed a law, three years prior to this period, authorizing the provincial assembly of Minas Geraes to make new roads through the most populous districts, and a loan was soon afterwards raised, of upwards of £40,000 sterling, to carry this law into execution. These ten leagues, that I found completed in the end of the year 1840, were undertaken on the worst part of the Minas road, the country through which it passes, being for the most part low and marshy. So great is the traffic on this route, that the amount collected at the toll-bars, was at this time sufficient to pay the interest on the loan, and in the course of a few years, it was expected that a tolerable cart-road would be completed from Rio de Janeiro to the capital of the Mining district.

Shortly after passing the toll-bar, we crossed the Rio Parahybuna on a temporary bridge, erected until a permanent one for the new road, which was in course of construction, could be finished: the abutments are already substantially built of stone, but the arch was to be of wood. On the banks of the river I found a beautiful species of the genus *Petræa*, climbing among the branches of the trees; and in a marsh, at a little distance from

the stream, a fine species of *Franciscea*, which grew where the water lay about two feet deep; it was very plentiful, and literally covered with its beautiful purple blossoms. On the third day afterwards, we passed the second toll-bar, and again crossed the Rio Parahybuna at the place where it divides the province of Minas Geraes from that of Rio de Janeiro. The river is much broader here than at the former place, and there is an excellent bridge over it, consisting of several small arches; the abutments and piers are built with stone, and the arches are of wood; the whole is roofed over to protect the wood-work from the influence of the weather. Shortly after crossing the river, we halted for the night at a little hamlet, called Paiol. The country on both sides of the river is very hilly, and before we reached Paiol, we crossed a rather high Serra, called the Serra das Abobras, which is composed entirely of Gneiss rocks, large blocks of which often render the path difficult to pass over. Before we reached the Rio Parahybuna, the road sides were covered with a beautiful species of *Bugenvillea*, which being at that season in full flower, was a great ornament to the woods, the large rose-coloured bracts of its flowers rendering it a very conspicuous object.

Our next journey brought us to the Villa de Parahyba, which is situated on the N.W. bank of the river of the same name, which we crossed here in a boat. The mules were not unloaded, but were taken over in a large flat punt, which conveyed about fifteen at a time. A strong iron chain was stretched across the river, at the height of a few feet above the water, to which the punt was

attached by a smaller chain with a ring on it, so as to allow it to run from one end to the other, and prevent the boat from being carried down the stream, which runs with considerable force; the punt was then pulled over by a rope, an operation in which three blacks were employed. About four years before I visited this place, a stone bridge had been begun, a few hundred yards from the ferry, but the erection of it was going on very slowly; the northern abutment and three piers were all that were then finished. The foundation on which it is built is good, the bed of the river at this place being formed of Gniess rock, the strata of which are nearly vertical. At the ferry, ninety reis (three pence) were charged for each animal.

Three days after we passed the Rio Parahyba, we arrived at a large Fazenda, called Padre Correa, the distance between the two places being about seven leagues; the road in many places was very bad, and the country still continued hilly and densely covered with virgin forests.

The Fazenda of Padre Correa is situated in a hollow surrounded by bare hills; the buildings, consisting of the dwelling-house, a small chapel attached to it, the Rancho, and a Venda, form nearly three sides of a large square, in the centre of which stands a very large tree, a species of wild fig, which a little above the root divides into two stems of nearly equal size. On a height to the east of the Fazenda, are seen two large rows of the Brazilian pines, which add much to the beauty of the place; a small river called the Piabanha, that passes near it, falls into the Parahyba. An extensive manufactory

of horse-shoes, and such iron implements as are used in the country, is carried on at this place. Our next journey brought me once more in sight of the sea. The road between Padre Correa and the pass of the Serra d'Estrella, which is a continuation of the Organ mountains, was then under repair; the workmen were Germans, who lived in a small village by themselves; we also passed through a small miserable village called Corrego Seco. The country very much resembles that I have elsewhere described, between the Organ Mountains and the Swiss colony of Novo Friburgo, being very hilly and covered with magnificent virgin forests. From the top of the pass, there is a fine view of the country around Rio de Janeiro, and of the bay with its numerous verdant islands. On reaching this spot, I stood for a long time admiring the first scenes of my labours in Brazil; my feelings, on looking down on the magnificent view before me, were such as would be experienced after returning to my native country, for everything brought to my recollection the remembrance of past times, and of kind friends, the Sugar Loaf, the Corcovado, the Gavea, and the Peak of Tijuca, were rearing high their cloudless summits, as if to welcome me back to a place of civilization.

The most elevated part of this pass, is about 3,000 feet above the level of the sea; the descent of the Serra, from its zigzag nature, is about a league in length; it is well constructed, being paved with large blocks of stone, and is kept in excellent repair; as it was rather steep in some places, and the road was good, I preferred walking down it to riding. A little beyond the foot of the Serra, we passed Mandiocca, the estate which formerly

belonged to M. Langsdorff, the late Russian Consul General in Brazil, and celebrated traveller; it now belongs to the Government, and has been converted into a gun-powder manufactory. The Estrella pass is much better than that of the Organ Mountains, but by the latter, the journey to Minas is shortened by about sixteen leagues. A little way beyond Mandiocca, we halted at a large Rancho, whence, after having arranged the collections that had been made on the journey, I started alone for the Porto d'Estrella, with the intention of embarking there in the evening for Rio de Janeiro, so as to have a place prepared for the reception of my luggage, previous to its arrival. The distance I had to ride, was about three leagues, through a flat, generally marshy country, quite like that between Piedade and the beginning of the ascent to Mr. March's estate. It was late in the afternoon when I arrived at the village of Porto d' Estrella, and as boats can only start for the city after the sea breeze has ceased to blow, I found that I had arrived much too early, and not having yet dined, I looked out for a place where I could procure something to eat; on enquiring of the lad at the Venda from whence the boats start, I was told they were in the habit of preparing repasts for travellers, and that if I wished him to do so, he would provide a dinner for me. After waiting with no little patience for upwards of two hours, I was at last shown into a small dirty back-room, when a dish of fish fried in oil, and Perão, a kind of thick paste prepared from Mandiocca flour, were set before me; but everything was so dirty, that very little sufficed to satisfy my appetite.

Nearly all the goods to be conveyed into the interior,

are shipped at Rio, in large boats called *Faluas*, and landed at this village, the packages being all of the same weight, so that they may counterbalance each other, when put upon the backs of the mules that are destined to carry them inland; there is therefore much activity here, as a day never passes without the arrival and departure of several large troops. The chief articles brought to this place from the interior, are coffee, cheese, bacon, quince marmalade, &c. The village is a long, dirty, straggling place, with few inducements to detain the traveller. About seven o'clock in the evening, I was informed that the boat I had hired was ready to sail, but I had no sooner got on board, than a heavy thunder-storm came rolling down from the mountains, and put off our starting for an hour. The village is a mile distant from the sea, being built on the banks of a small river, called the Inhomerim, and so slow was our progress, that it was eleven o'clock before we reached its confluence with the bay. At this point a very good inn exists, which, as I experienced on a future occasion, affords very good accommodation. As the land-breeze was very faint, the boat had to be rowed nearly all the way, and on this account it was about four o'clock in the morning before we reached the city. Not wishing to disturb any of my friends at so early an hour, I remained in the boat till six o'clock, when I went to the house of Messrs. William Harrison and Co., and received from my old friends there, a kind and hearty welcome back to Rio de Janeiro, after an absence of more than three years.

Two days afterwards, (on the 2nd of November, 1840), Mr. Walker arrived with all my luggage in good condi-

tion. Knowing, from former experience, how ill-suited either an hotel or a boarding-house are for a naturalist to carry on his operations in, I determined to hire a small house; and in the district called Catumby, which is in the immediate vicinity of the city, I found one that, in every respect answered my purpose. Having furnished it economically, I had my collections removed thither, and as they amounted to about 3,000 species, including upwards of 60,000 specimens in Botany alone, it took me about three months to classify and properly pack them, previous to their being sent to England.

During this residence in Rio, my time passed away very pleasantly, the agreeable society which I mingled with, making sufficient amends for the solitude and privations of the three preceding years. The days were generally devoted to my collections, and the evenings were spent with the families of some one or other of the many resident English Merchants. I had also the pleasure at this time, of making the acquaintance of Dr. Ildefonso Gomez, a talented Brazilian physician, who, when a young man, accompanied M. Auguste de St. Hilaire on his first journey to the mining districts. His house, which is in the country, and only a mile from my residence, was always open to me, as it ever has been to all scientific men who have visited Rio. I likewise spent many agreeable hours with my near neighbour M. Riedel, the Russian Botanist, and companion of M. Langsdorff in his journey through the interior of Brazil, and we made several excursions together to the woods, in pursuit of objects connected with our favourite science.

As soon as my labours in Rio were brought to a con-

clusion, I resolved to make another journey to the Organ mountains, being desirous of devoting more time to the investigation of the botany of the higher regions of that chain, than I had been able to do, during my former residence there. For this purpose, I left Rio on the 12th of March, 1841, and during the following month, occupied myself in making excursions on Mr. March's estate. The weather was too variable to think of making a journey to the top of the Serra, but by the beginning of April it became more settled, and having been joined by Mr. George Hockin, a gentleman from the house of Messrs Harrison, and Co., who had frequently accompanied me in my previous excursions in the neighbourhood of Rio, preparations were made for ascending the mountains on the 9th. We left the Fazenda about 8 o'clock A.M., taking with us three blacks, besides my own servant; my old guide, Pai Filippe, was now too infirm to undertake such a journey, but his place was filled by one of his sons. Following the path I had made four years before, we reached, about four o'clock, the highest point I had attained on my former visit, and at this place, under the ledge of a rock, we slept for the night; this being a very convenient, and well sheltered spot, we decided to make it our head quarters during the few days we remained in the mountains. Besides specimens of nearly all the plants which I found on my previous journey, I collected on the ascent, many that were new to me; two of the most remarkable of these were a kind of *Fuchsia* (*F. alpestris*, Gardn.), and a very extraordinary species of *Utricularia*; the latter to which I have given the name of *U. nelumbifolia*, has since been published in Hooker's

Icones Plantarum, where a very excellent figure of it is given; like most of its congeners, it is aquatic, but what is most curious, is that it is only to be found growing in the water which collects in the bottom of the leaves of a large *Tillandsia*, that inhabits abundantly an arid rocky part of the mountain, at an elevation of about 5,000 feet above the level of the sea. Besides the ordinary method by seed, it propagates itself by runners, which it throws out from the base of the flower stem; this runner is always found directing itself towards the nearest *Tillandsia*, when it inserts its point into the water, and gives origin to a new plant, which in its turn, sends out another shoot; in this manner I have seen not less than six plants united. The leaves, which are peltate, measure upwards of three inches across; and the flowering stem, which is upwards of two feet long, bears numerous large purple flowers.

On the following morning, after an early breakfast, we set out to ascend that part of the Serra, which appears from the Fazenda house, to be the highest; this peak, which I had been prevented from ascending in 1837, was reached in the following year by the Rev. Mr. Maister, who was then the English clergyman at Rio; and again about six weeks before our visit, by Mr. Lobb, an English gardener, who had been sent out by a nurseryman to collect seeds and living plants; we thus found a path ready made for us. This part of the mountain is about 600 feet higher than the spot we had chosen for our bivouac. Starting then from this place, we made a descent into a wooded ravine, in which the ground was covered by the beautiful *Alstroemeria nemorosa*, and many delicate ferns, while the branches of the *Melastomaceæ*,

and other trees and shrubs, were festooned with the climbing *Fuchsia*, brilliant with its rich scarlet blossoms. Then ascending for some time, through a well wooded tract, we entered upon a steeper portion of the mountain, overspread with beautiful flowering shrubs, among which were several fine *Melastomaceæ*, fruticose *Compositæ*, a *Gualtheria*, some species of *Vaccinium*, and a handsome new *Escallonia*, (*E. Organensis*, Gardn.), bearing a profusion of rose-coloured blossoms. The summit of this peak we found to consist of several enormous loose blocks of granite, covered with *Lichens*, small species of *Orchideæ*, *Gesneraceæ*, and where there was any accumulation of soil, a large-flowered *Amaryllis* (*Hippeastrum Organensis*), now common in English hot-houses; the climbing *Fuchsia* in a dwarf procumbent state was also found here. Upon reaching the summit, we erected a pole and flag, in order to give notice to our friends below, that we had got up in safety; and immediately afterwards, by the aid of a glass, we saw it answered by another from one of the English cottages, near the Fazenda. The day was beautifully clear, and we had a splendid view of the surrounding country. On looking to the westward, however, it was evident that we were not on the most elevated point of the range, as we observed, about a mile distant, a broadly rounded peak, considerably higher; and we accordingly determined to ascend it on the following day. I here met with two very interesting plants, one a beautiful tree-fern, which proved to be the *Hemitelia Capensis*, a native of the Cape of Good Hope, which is a remarkable fact in the geographical distribution of plants, as tree-ferns have a very limited range; the other

was a very handsome herbaceous plant, about four feet high, with a woolly stem, and large leaves, not unlike those of a *Verbascum*, exhibiting large panicles of orange coloured flowers; it belonged to the natural order *Compositæ*, and as it proved to be a new genus, I named it after my late lamented friend, J. E. Bowman, Esq., of Manchester.

Early on the following day, we started to ascend the loftiest peak of the mountain, before noticed, and found it to be a more fatiguing journey than that of the previous day, in consequence of having to cut our way through two or three wooded tracts, of considerable breadth; the paths of the Tapir, however, frequently facilitated our progress. Very shortly after we started, we were agreeably surprised to find, in the lower part of the valley we had to cross, a beautiful little stream of cool and limpid water, descending from the more elevated parts of the mountain, and flowing towards the east; in many places there were pools considerably broader and deeper than the general course of the stream, which, judging from the paths leading into them, had been formed by the Tapirs that inhabit this portion of the mountain, where they can enjoy, undisturbed, their favourite luxury of cold bathing. This valley is somewhat less than a quarter of a mile square, and is covered on both sides of the stream, but particularly on the west, with virgin forests, the trees of which are of considerable size, one of the largest being a species of *Weinmannia*. The soil appears to be of excellent quality, there being a good depth of alluvial matter; indeed, in no part of Brazil have I seen a spot where a person, desirous of ex-

cluding himself from the world, could find a retreat, at once so healthy, beautiful, and fertile, as this; here all kinds of European fruits and vegetables might be cultivated in the greatest perfection; and the stream, besides furnishing a constant supply of the most delicious water, might likewise be made to work a small mill. Passing over a hill that bounds the western side of this valley, we came upon an open flat marshy tract, the greater part of which is covered with a tall coarse grass, about five feet high, growing in tufts. Leaving this, we entered another wooded spot, formed of trees of a much smaller size than those before observed, and passed through it along the tracks of the Tapir, where I was rather surprised to observe that while the stem and branches of almost every tree were covered with the beautiful little *Sophronitis grandiflora*, no other orchideous plant was to be seen; beyond this, we met with no more wood; the vegetation consisting of various herbaceous plants, and a few stunted shrubs. From the wooded region, the summit of the mountain is gained by a steep acclivity, on one side of which is a broad ravine, full of immense blocks of granite.

The summit of this peak we found to be very different from that we visited the day before, consisting of one great mass of granite flat on its surface, and of considerable extent; the rock is, for the most part, bare, but some portions of the western side were covered with a vegetation of stunted shrubs, and herbaceous plants; among the latter, the most abundant was the pretty *Prepusa Hookeriana*, the large inflated calyces of which resemble those of some species of catchfly; on the very summit, were seen many little excavations in the rock, full of excellent water, and

had we been aware of this, it would have saved us the trouble of carrying with us a supply in bottles. The day was very fine, but a broad belt of clouds that spread around the mountain, below us, prevented us from enjoying the extensive view on which we had fully calculated. At mid-day, the thermometer indicated a temperature of 64°, in the shade, and I found that water boiled at a heat of 198°, from which I estimate the height of the mountain, above the level of the sea, to be 7800 feet. A register of the thermometer, kept during our stay on the upper regions of the Serra, and another observed on the level of Mr. March's Fazenda, gave a mean difference of temperature between the two places, of 12. 5 degrees. Baron Humboldt estimates the mean decrement of heat within the tropics, at 1° for every 344 feet of elevation, and considers this ratio as uniform up to the height of 8,000 feet, beyond which it is reduced to three fifths of that quantity, as far as the elevation of 20,000 feet; it has, however, been since found, that in general, the effect of elevation above the level of the sea, in diminishing temperature, is, in all latitudes, nearly in proportion to the height, the decrement being 1° of heat for every 352 feet of altitude*; this would give 4,400 feet for the elevation of the highest peak of the Organ mountains, above Mr. March's Fazenda,† and as this is 3,100 feet above the level of the sea, we have for the total greatest elevation, 7,500 feet. We returned to our former resting-place in the evening, well pleased with our day's excursion.

* Phillips, Treatise on Geology, in Lardner's Cyclopedia, vol. ii. p. 227.

† For view of the Organ Mountains, and Mr. March's Fazenda, see Frontispiece.

On the morning of the 12th, at 6 o'clock, the thermometer indicated 44°, the weather being very clear, and accompanied with a sharp breeze from the westward. On climbing to the top of the rock under which we had slept, one of the most magnificent views I have ever seen presented itself; towards Rio de Janeiro, the immense bay, and all the country intervening between it and the mountain, were hidden from us, by a mass of snow white clouds, spread out, apparently, about 3,000 feet below the point where we stood; shortly after sunrise, this space appeared like a vast ocean covered with foam, the resemblance being increased by the tops of the lower mountains rising through them, like islands; in the opposite direction, the valley in which Mr. March's Fazenda stands, was also obscured, in a similar manner, by clouds, giving it the appearance of an extensive lake, surrounded on all sides by mountains; but as the sun gained power, these clouds gradually dispersed. After breakfast, Mr. Hockin started again to visit the highest peak, for the purpose of making a panoramic sketch from its summit, but did not succeed, owing to the cloudy state of the atmosphere that surrounded it; I did not accompany him, as I preferred making a few lateral excursions in the vicinity of our encampment. Late in the evening we observed a phenomenon, often witnessed on the tops of mountains; large masses of clouds, in a continued stream, came rolling from the westward, over the tops of the peaks, but no sooner had they reached the upper part of the valley opposite our hut, than they disappeared, the vapour being dissolved by the higher temperature of the air that existed on the opposite side of the mountain; it

is in this manner that a mass of clouds is often seen as if resting on a high peak, even when a strong breeze is blowing. On the morning of the 13th, we bade adieu to our rocky dwelling, and slept that night in a little hut we erected in a grove of small palms and tree-ferns, by the side of a small stream, the sides of which were fringed with beautiful herbaceous ferns. On the following afternoon, we reached the Fazenda, after an absence of six days.

In order to gratify my desire of examining the extensive virgin forests which exist on the banks of the Rio Parahyba, I determined to make a hurried visit there previous to my return to Rio de Janeiro. The Parahyba forms the boundary between the provinces of Rio and Minas Geräes, but only after it has been joined by the Parahybuna. On this expedition I was again accompanied by Mr. Hockin, and was glad to have so excellent a companion. We left the Fazenda on the 24th of March, and after a journey of seven leagues, arrived at a farm called Serra do Capim. We followed a new road, which was in progress of construction under the superintendence of Col. Leite, a wealthy planter, leading from Piedade, over the Organ Mountains, towards Minas Geräes, but it was then in a barely passable condition. By far the greater part of the country through which we travelled, was in a state of nature, being covered with virgin forest, abounding in tree-ferns and palms. The Fazenda, where we rested, belonged to a gentleman residing in Rio, but the letter I carried to the manager of the farm procured us a hearty reception; corn was immediately ordered for our mules, and we were shortly regaled with an excellent sup-

per. We found our host to be a kind and intelligent old man, who informed me that he had followed the profession of apothecary for many years in Minas; like most of the Fazendeiros in Brazil, he acts as physician to the hospital of this estate, so that he was glad of an opportunity of consulting me on most of the cases under his charge. Next morning he would not allow us to depart till after breakfast.

On leaving this place we soon passed through some of the finest forests I had yet seen in the province, and in the afternoon arrived at a large coffee plantation, called Monte Caffé, the distance being about seven leagues. This Fazenda belonged to a Brazilian, called Brigadeiro Ignacio Gabriel, to whom I had also letters of recommendation. Although we did not find him at home, we were most kindly welcomed to the estate by his lady, and Mr. Hadley his chief manager, who is an Englishman, and whom I had formerly met at Mr. March's, during my stay there in 1837. The estate was at this time only in its infancy, but it was considered to be one of the finest in the district, and although the trees were young, it was expected they would this year yield 12,000 arrobas of coffee, of 32lbs. each. At the period of our visit, the berries were just beginning to colour, and the branches were bent down with the weight of their produce. The country here consists of low hills, upon which the plantations are formed; these hills had previously being covered with forest. There were about 200 slaves on the estate, 70 of whom only were employed as field-labourers, the others being occupied at various trades, such as cabinet-makers, carpenters, masons, blacksmiths, &c. A few

days previous to our arrival, about twenty young Negro boys, recently imported, were brought up from Rio; they appeared to be between ten and fifteen years of age, and none could yet speak Portuguese. They were all active, healthy little fellows, running about laughing, playing, and seemingly happy and unconscious of the circumstances in which they were placed. In justice, however, to the Brazilians I must say of them, after an experience of five years, that they are far from being hard task-masters, and that with very few exceptions, I found them kind and considerate to their slaves. The Brigadier had lately erected an excellent saw-mill, which was driven by water-power, and he was then erecting a large stove for the purpose of drying coffee by artificial heat. The superintendence of this work was undertaken by a German, who had resided for many years in the island of Java.

On the morning of the 28th we left Monte Caffé, and proceeded on our way to the Rio Parahyba, which was only about a league and a half distant. Mr. Hadley accompanied us for about a league, and while passing through a small estate called Santa Eliza, which adjoins Monte Caffé, and belongs also to the Brigadier, he informed us that about twenty years before, it was owned by a person who made use of the house as a place of decoy for travellers to and from Minas Geräes, and who, as soon as they fell into his snares, were robbed and murdered. His house is still standing, but is now uninhabited; the trap-doors which he employed for these diabolical purposes are still to be seen in the floor. We shortly afterwards came in sight of the river, and reached the banks at a place where the stream rushes with great force through a

narrow, rocky channel. We expected to have been able to pass it here, but were told that we could not do so for want of a canoe, and were advised to go a league and a half further up to a place called Sapucaya, which we accordingly did. The road for nearly the whole distance runs parallel with the river, through a most magnificent forest, the trees being of great size, and in general with very straight stems, often rising unbranched to a height of upwards of one hundred feet. In riding along I could not help feeling deep regret, that in these regions many square leagues of such forests were being every year cut down and burned, in order to make room for plantations of coffee. There are no means of conveying this fine timber to the coast, as the river, although of considerable flow, is not navigable for rafts, owing to its many rocky rapids. At this place, I observed the bed of the stream to be formed of thin strata of Gneiss rocks, cropping out vertically, and like the course of the river running from west to east.

Sapucaya is a small hamlet, consisting of a few houses of very recent construction, which owe their origin to their proximity to a new bridge, at this time in process of erection across the river, in connexion with Colonel Leite's new road to the province of Minas Geräes. We here found a canoe, suited only for foot-passengers; horsemen, we were told, seldom came this way at this season, owing to the swollen state of the stream, and the rapidity of its current rendering it dangerous to swim horses across. We were consequently advised to go another league and a half farther up the river, to a place called Porto d'Anta. At Sapucaya we gave our mules a feed of Indian corn,

but we could find no refreshment for ourselves, excepting a few Bananas and a little Farinha de Mandiocca, upon which we made our dinners. On the stems of the trees in the forest, I met with many fine orchideous plants, one of the most abundant, and certainly the most beautiful, being the *Cattleya labiata*. The country between Sapucaya and Porto d'Anta, which we reached about dusk was somewhat similar to that observed lower down the river, but not so well wooded. At this place we were at length enabled to cross the river, there being a regular ferry-boat established for horses, consisting of three large canoes lashed together, planked over and railed round. The river here was about the breadth of the Clyde at Erskine Ferry, but the current was much more rapid. The Barca, as the ferry-boat is called, was rowed across, but, in consequence of the current, the boatmen were first obliged to ascend the river a considerable way before they began to cross. We found a very good Venda on the opposite side of the stream, where we put up for the night, and where we had in a short time a very excellent supper, and were provided with tolerable beds.

Next morning after breakfast, we went on to a Fazenda called Barra de Louriçal, belonging to Colonel Custodio Leite, whom I have before alluded to, as superintending the construction of the new road, and whom I had frequently met at Mr. March's during my former stay there; this place is about a league and a half distant from Porto D'Anta, and we had again to descend along the banks of the river about a league, by a very romantic road that leads through a fine forest abounding in objects of great interest to the botanist, as well as

the zoologist; we observed numerous monkeys passing along the branches of trees over our heads, particularly a large black howler (*Mycetes*), the females of which were carrying their young upon their backs. We then struck off to the north, and reached the Fazenda early in the forenoon; we did not find the Colonel at home, but one of his sons received us very kindly. This is a very fine estate yielding annually about 10,000 arrobas of coffee. On the following day we went to pay a visit to Captain Francisco Leite, a brother of the Colonel, whose Fazenda is about a league and a half farther north. We were fortunate enough to find him at home, when he showed us all that was worth seeing on his estate; he is a tall thin man, and although considerably advanced in years, is of a most active and lively disposition. He informed me he was a native of the mining districts, and began his career as a simple gold-washer, having been fortunate enough to acquire a little money, he left that occupation and purchased this estate about twenty years before our visit, at a time when it was entirely covered with forest. He is now one of the most wealthy, if not the wealthiest individual in this part of the country; the cultivation of coffee having enriched most of the inhabitants of this fertile region. His estate yields him about 11,000 arrobas of coffee; and also a considerable quantity of cheese, sugar and rum, which are chiefly sent to market in Rio de Janeiro. He was very desirous we should remain all night, but we were obliged to refuse his hospitality, having promised to return to the house of the Colonel, with the intention of resuming our journey early on the following day.

On the morning of the 31st. we left Colonel Leite, and in the evening reached Porto da Cunha, which is six leagues further down the river; we had to travel more than eight leagues, having mistaken our road. Some parts of the country through which we travelled were very romantic, particularly by the side of the river, the banks of which were often rocky and well wooded; the forests are, indeed, the most magnificent that it is possible to imagine. We passed a few small houses belonging chiefly to coloured people, but it was only towards the termination of our journey that we saw one or two large coffee plantations. About three o'clock in the afternoon, while we were passing through a very dense tract of forest country, we came upon a place about three or four acres in extent, that seemed to have been lately cleared, with a small house formed of stakes and palm leaves, standing in the centre. On arriving at the house, we found it belonged to an Indian family, consisting of a man, his wife, and four children. They were just collecting their crop of Indian corn, a good feed of which was readily obtained for our animals, but we could procure nothing eatable for ourselves. At some distance beyond this place, I found, in a rather open part of the forest, a beautiful arborcous species of *Bugenvillea*, quite distinct from any yet described; it forms a tree from twenty to forty feet high, with a stem more than two feet in circumference; unfortunately I lost all the specimens I collected, through the carelessness of my servant. In the deep forests, I found many different Orchideous plants upon the stems of the trees, among which was the rare and beautiful *Huntleya meleagris*.

It was quite dark when we reached Porto da Cunha, where we could find no place of accommodation; we were first referred to a Venda a little way further down the river, but on arriving there, we found it to be a new house in an unfinished state, and not yet inhabited, so that it offered no accommodation for man or beast. From this place we were directed to a small village about half a league still further down the river, called San José, but at the same time we were informed, that about half way to the village, we should see a small Fazenda belonging to an elderly widow, who sometimes gave shelter to travellers; we accordingly made application at this place, and were received for the night. The house had certainly a very miserable appearance, but we were glad to find any sort of quarters. The old lady, whose name was Dona Custodia, was, however, rather suspicious of us, perhaps from our arriving at so late an hour, for looking over the balcony, she asked us why we did not go to different houses she mentioned; but, on replying that we were strangers, and had no acquaintance with those individuals, she then told us to dismount. Corn was immediately ordered for our animals, and in a short time supper was sent to us, consisting of a little fried salt beef, and several dishes prepared from the Indian corn meal, which though a very poor substitute for a meal, afforded us, as we were hungry, a hearty dinner and supper at the same time. Shortly afterwards, we were shown into our bed-room, a little closet, with two camp bedsteads in it, on one of which a miserable black man was sitting, who also appeared to be a traveller; the other we were told was at our disposal, and we had no alternative but to make use

of it; a hide was spread on the floor for the servant and in this small room, which was scarcely large enough for two persons, four of us had to pass the night. To crown all, the roof was so bad that we might have studied astronomy through it; and the window, which was not glazed, and without a shutter, looked into a pig-sty, by the inmates of which we were aroused early in the morning. If, however, the accommodation was bad, the charge made for it next morning was but a mere trifle, amounting only to one shilling and eight pence in all, including, besides, a cup of coffee in the morning, and another feed of corn to the mules. I gave her about double the sum, with many thanks besides for her kindness, with which she was not a little pleased. She had once, she told us, been in better circumstances, in the Mining district, but had lost her money in some unfortunate mining speculations, and had come down to this place with her son, to endeavour to gain a livelihood by making sugar and rum, which they dispose of chiefly in the adjoining village.

From Dona Custodia, we went on to the Arraial de San José, in the hope of getting a comfortable breakfast, but in this we were disappointed, as nothing was to be had there. We then returned to the Porto da Cunha, where we were equally unsuccessful, but were informed that a breakfast might be had at a Venda on the opposite side of the river; there is a ferry at this place, which is in the hands of the provincial government of Minas Geräes, and a sergeant is stationed here, who levies the passage money, as well as the duties payable on such articles as are sent out of the province; as it was our

original intention to re-cross the river at this place, we lost no time in accomplishing it, the conveyance being exactly the same as that at Porto d'Anta; when we went up to the Venda, we found, to our astonishment, that they could give us nothing to eat; but the lad who kept the Venda, and who was a most uncivil wretch, at last told us that he had some salt fish and rusks, which we might purchase, but that he would not cook the fish for us; this, however, we contrived to do ourselves, at a fire which our servant kindled outside.

Leaving Porto da Cunha, we went on in an easterly direction, it being our intention to visit a small town, called Cantagallo, which at one time was a famous place for gold washing. Very shortly after we started, we passed through a large coffee estate, belonging to the celebrated Brazilian deputy, Carneiro Leão, and about a league further on, came upon the Rio Paquequer grande, down the south banks of which we went a considerable way, through some fine forests. Towards dusk, while we were pushing on, without knowing where we might find quarters for the night, we met a young man, who had been out hunting, and by him we were informed that there was a Fazenda only a little further on, to which he belonged, where no doubt we should be welcome to spend the night; we also learned from him that we were not on the right road to Cantagallo, although it would take us to it but by a worse, and more circuitous route. Arrived at the Fazenda, we were shown into a well furnished apartment, and immediately after, the owner came to bid us welcome. Learning that we came from Mr. March's Fazenda, he came up, shook me by the hand,

when I recognized him to be a Dr. Saporiti, who about a month before, had stopped a night at Mr. March's, on his way from the city; he expressed himself greatly delighted to see us, ordered coffee, and told us we should shortly have supper. In the mean time, he introduced us to his lady, whom we found to be more refined in her manners than the generality of the wives of Fazendeiros, no doubt from her having resided many years in Rio de Janeiro. The young man who conducted us to his house, we found to be her son by a former husband. Dr. Saporiti is an Italian by birth, but had been upwards of twenty years in Brazil. About ten o'clock we sat down to an excellent supper, and altogether the evening passed away most agreeably, from the enlivening conversation of our host and hostess, the latter in particular, amusing us with the pictures which she drew of rustic life in the distant province of Mato Grosso, of which she is a native. Next morning, breakfast was prepared early on our account, as we wished to start in good time. Owing to the bad state of the roads, it was six o'clock in the evening before we reached Cantagallo, though the distance was only four leagues; the country is thickly wooded, and in general, rather level. On the descent of a high hill, we passed through a large coffee plantation which had been abandoned, in consequence of the cold being too great to allow the berries to come to perfection. Between this, however, and Cantagallo, we saw some very extensive plantations, both the soil and climate being admirably adapted for the growth of the coffee plant.

The Villa of Cantagallo is situated in a narrow valley bounded on each side by rather high hills; it consists

principally of one long street, and a large square, of which only two sides are completed; the houses are mostly well built, and on the whole it has a neat and clean appearance. Formerly there were many gold washings in the neighbourhood, but now scarcely any one occupies himself in searching for this metal. The great article of product is coffee, with which immense tracts are planted; it is conveyed by mules to the head of the bay, and then shipped for Rio. We took up our quarters at an inn kept by a Frenchman, a man of immense size, and well advanced in years, who informed us that in his youth he belonged to the body guard of Napoleon. On the second morning after our arrival, we resumed our journey, and at nine o'clock P.M. reached the Swiss colony of Novo Friburgo, about eight leagues distant. The first part of the journey leads through a level country which is well cultivated, but the road afterwards becomes very mountainous, particularly during the last two leagues, through a wild and romantic deep pass; though it was late before we reached the end of our journey, the brilliant moonlight enabled us to admire some of the beauties of the scenery.

The town of Novo Friburgo, called also Morro Queimado, is built in the form of a square, with the houses nearly all of one story; it is inhabited principally by natives of Switzerland, who emigrated to Brazil many years ago; several Brazilian families also reside here. About a mile to the west, there is a small village in which the Protestant part of the settlers live. The greater number of the colonists, however, are scattered in the country for several miles round. They are very

poor, having been placed by the Brazilian government in one of the worst possible places for the exertion of their industry, the situation being elevated more than 3,000 feet above the level of the sea, with a bad soil, and a climate quite unfitted for the cultivation of either coffee or sugar. Their principal crops are Indian corn, and a few European vegetables; they also make a little butter. The climate being very agreeable during the summer months, many families, both foreign and Brazilian, come here to escape the great heat of the city. The mountain scenery around is very fine, but is far from equaling that of the Organ Mountains. There is a good inn in the town, kept by a Swiss, where we put up during our short stay.

We left Novo Friburgo on the 6th of April, and returned to the Organ Mountains. Passing in a westerly direction through a hilly, wooded country, we arrived in the afternoon at a small house situated in a valley by the side of a little stream, where we were glad to take up our quarters for the night, as it had rained heavily from about midnight; we could get nothing for our dinner but a few boiled cabbage leaves and rice. A short time before we arrived at this place, we passed through a dense forest of large trees, on the stems and branches of which, grew immense quantities of the beautiful *Gesneria bulbosa*, the large panicles of which, consisting of numerous brilliant scarlet flowers, hung down over our heads in the path. Orchideous plants were also abundant; one of the finest of which, the *Oncidium Forbesii*, was in flower. On the following night we slept at a small estate belonging to Admiral Taylor, an Englishman who has been long in

the Brazilian service, whom I knew well, but we did not find him at home; and in the afternoon of the next day, after a ride of about three leagues, we arrived at Mr. March's Fazenda.

Notwithstanding that this visit to the Organ Mountains was made at the same season as my previous one, the variety of the vegetation is so great, that I added to my collection several hundred plants I had not formerly met with. My general health, which had suffered a good deal from the fatigues of my long journey in the interior, and by pretty close confinement for three months in Rio during the hot season, improved wonderfully by my sojourn on the mountains. There were not so many English families here at this time as there were in 1837, and there was consequently less gaiety; but most of my leisure hours were spent agreeably at one or other of the cottages.

CHAPTER XV.

MARANHAM, VOYAGE TO ENGLAND, CONCLUSION.

Leaves the Organ Mountains and returns to Rio de Janeiro -embarks for England with large Collections of living and dried Plants—Touches at Maranham—City described—Its Population—Public Buildings—and Trade—Geology of its neighbourhood—Visits Alcantarà—Sails for England—Gulph Weed—Its great extent and origin—Flying Fishes—Observations on their mode of flight—Remarkable Phosphorescence at Sea—Description of the singular animal that causes this phenomenon—Its curious nests—Scintillations at Sea caused by a very minute kind of Shrimp—Arrives in England—Concluding remarks.

Learning that there was a vessel in the harbour at Rio, about to sail for Liverpool, and being now anxious to return to England, I put my collections into order, and left the Organ Mountains on the morning of the 25th of April, reached Piedade the same evening, and arrived in the city early next morning. Besides Botanical specimens for the Herbarium, I collected during my residence on the mountains a large number of the most beautiful plants in a living state to take home with me. They filled six large Wardian cases, but scarcely half of them reached England alive, owing to the boxes not having been properly constructed; many of those which survived are now widely dispersed, and are very ornamental plants.*

* Among those which were introduced to England for the first time on this occasion, may be enumerated the following :—*Siphocampylus*

Early in the morning of the 6th of May, I went on board the barque "Gipsey", which shortly after got under weigh. She was not, however, bound for England direct, having to call at Maranham, in the north of Brazil, to take in a cargo of cotton. I was thus unexpectedly afforded an opportunity of seeing another of the large Brazilian sea-ports, and of making a few collections in a part of the empire, which possesses a different vegetation from any I had hitherto visited. We had a fine run to Maranham, which place we reached in fifteen days. The night before we made land, we had a strong breeze off shore, which brought with it a vast number of moths and butterflies of all sizes, and of those that came on board, I was enabled to make a collection of about a dozen species. The land here, as at Pernambuco, is very flat; the great sea-ports of Brazil diminish in importance from south to north, the most important being Rio, the next Bahia, the third Pernambuco, and the fourth Maranham. The town of S. Luiz de Maranham is situated on a slightly elevated part of the north-west end of an island of the same name, which is about seven leagues long by five broad, and is separated from the main land by a channel of no great breadth. The river, in the mouth of which it is situated, is formed by the union of several

betulæfolius, G. Don.; *Pleroma Benthamiana*, Gardn. and *P. multiflora*, Gardn.; *Franciscea hydrangeæformis*, Pohl; *Nematanthus longipes*, Pohl; *Gesneria salviæfolia*, Gardn., and *G. leptopes*, Gardn.; *Clusia fragrans*, Gardn.; *Luxemburgia ciliata*, Gardn.; *Dorstenia elata*, Hook.; *Prepusa connata*, Gardn., and *P. Hookeriana*, Gardn.; *Campomanesia hirsuta*, Gardn.; *Bidens speciosa*, Gardn.; *Bowmania speciosa*, Gardn.; *Anemia stricta*, Gardn. M.S.; *Pteris sagittæfolia*, Raddi; *Alstrœmeria nemorosa*, Gardn.; *Euterpe edulis*, Mart., and *Corypha cerifera*, Mart., from Maranham.

smaller ones which take their origin in the south-western portions of the province. The population of the town is said to amount to about 26,000; the houses are substantially built of a reddish coloured sand-stone, are mostly of two stories, and more regular in their appearance than those of the other large Brazilian cities; the streets are generally well paved, and cleaner than any I have seen in the country, no doubt owing to many of them having a slight inclination, which allows them to benefit by the heavy falls of rain that had already set in when we arrived. It contains eighty-five churches; the palace of the President forms part of a large square, the remainder of which consists of a large building formerly the College of the Jesuits, the prison, and the town-hall. A very considerable trade is carried on here both of import and export: most of the European goods which arrive, are sent up to the interior of the province, and also into that of Piauhy; the principal exports are cotton and hides.

On my arrival at Maranham, I was very kindly received by the English residents there, who had heard of me when I was at Oeiras, and was invited to take up my quarters in the house of the English physician, Dr. Arbuckle. As the ship remained about three weeks, I had ample time to make a few excursions in the neighbourhood, but was prevented from seeing as much of the country as I wished, on account of the rains.

The island on which the town stands is very flat, in some places marshy, and covered with a vegetation of shrubs and small trees. In the marshes grow some fine Palms belonging to the genera *Attalea* and *Euterpe*. There are but very few cocoa-nut trees; and indeed the general

appearance of the country indicates a less humid climate, and consequently a less vigorous vegetation than exists towards the southern tropic. On the island there is but little cultivation; much of the soil is of a sandy nature on the surface, and below that, of a gravelly character, highly impregnated with iron; and the same also is the case on the continent opposite the town. The rock which forms the basis of the island, is a dark red sandstone, similar to that which I found in the provinces of Ceará and Piauhy in connection with the chalk formation of those parts of the country. In many places it is of a conglomerate nature, the rounded stones being of the same character as the softer matrix in which they are imbedded. On the opposite continent, near the town of Alcantarà, I found the same rock rising only a little above the level of the sea, but overlaid by another rocky deposit, more than fifty feet thick in some places, consisting of alternate strata of yellowish and greenish coloured sand-stone, irregularly deposited, soft, and in some places of a marly nature. These rocks I have no hesitation in considering as equivalent to those which underlie the white chalk near the Villa do Crato and Barra do Jardim, in the interior of the province of Ceará, and they no doubt formed part of the great chalk deposit, which seems at one time to have covered the eastern shoulder of the South American continent, but which in many places has since disappeared.

Besides making excursions in all directions in the island, I also crossed over to Alcantarà, where I remained three days. I had a letter of introduction to the principal merchant in the place, Senhor Peichoto, a native of Por-

tugal, and with him I lived during my stay there. I crossed the bay, which is about four leagues broad, in one of the regular trading vessels, which are about forty tons burden; these carry over from Alcantarà, cotton and fire-wood, the former is cultivated at some distance in the interior, whence it is brought in on the backs of horses; the fire-wood is obtained from the stems and branches of the mangrove *(Rhizophora Mangle)*, which grows in great abundance along the muddy shores: it burns in the green state better perhaps than any other kind of tree. Along these muddy shores great flocks of the beautiful Red Flamingo *(Phœnicopterus Chilensis*, Molina*)*, are almost always to be seen. At night they roost among the mangroves, and are much sought after by the inhabitants, who consider their flesh excellent food. The town of Alcantarà, like that of Maranham, is situated on a rising ground, and seems to have been once in a more flourishing state than at present; the houses and churches are mostly large, but are in a very dilapidated state, while the streets are overgrown with weeds. The more wealthy people who reside here, are the proprietors of cotton plantations, while the poorer, gain a livelihood by fishing and making hammocks, for which latter article there is a great demand through the northern provinces. Some of these are so finely worked, that they sell for as much as six or eight pounds each: they are made of fine cotton cords, and are either altogether of a white colour, or white and blue, the latter colour being obtained from the wild Indigo, which grows abundantly all over the country. There are *Salinas*, or salt-pits, a few miles to the north of the town, which formerly belonged to the Jesuits, and

were profitably worked by them, but they are now very much neglected. Along the shore, and scattered here and there among the bushes on the low hills, I saw a few plants of the wax palm (*Corypha cerifera*, Mart.), which is so common about Aracaty in the province of Ceará.

In the course of my rambles in this neighbourhood, I met with many plants that were new to my Collections; the Flora of Maranham has greater affinity with that of Guiana, than with any other part of Brazil I have visited, as might indeed be expected from its northerly position; it is also well known that such plants as grow only near the sea, have a far more extensive geographical range, that those which grow inland. I was particularly struck with this fact in travelling into the interior from Pernambuco and Aracaty: at both of these places are seen many plants common to the shores of the West Indies, Guiana, and nearly the whole of the intertropical coast of Brazil, while in the same parallels of latitude, from a little way inland, to the most western point I reached, the vegetation had a distinct character from that of any other place. The same observations apply to extensive plains, the vegetation of which is so frequently and annoyingly monotonous to the botanist, while on elevated tracts a much greater diversity occurs. It was the knowledge of this fact that induced me, during the whole of my travels, to keep as much as possible along mountain chains and elevated table lands. No satisfactory reason has yet been suggested, to account for the greater number of species which exist in a given space on a mountain, than on a plain; temperature, light, and moisture, no doubt play the most

important part, but there must be other causes yet unknown.

At Maranham I met two of my Oeirās acquaintances; one of them, though a major in the army, was also a merchant, who had come down to purchase European goods, the other a son of the old Baron of Paranahiba, whose object was to enter into holy orders, previous to his being appointed Vicar of Oeiras. From them I learned that the insurrection had at last been put down, and that the province was subsiding into a more settled state. The authorities were apprehending all those they could lay their hands on, who had been engaged in the affair, and sending them to the province of Rio Grande do Sul, to fight against the rebels there; a rare piece of policy! I saw several parties of them brought down, and a very ill looking set of fellows they were.

The ship at length having taken in all her cargo, I embarked, and finally bade adieu to the shores of Brazil, on the morning of the eight of June. While we were in about the fifty-sixth degree of west longitude, and between the twenty-second and twenty-eighth degrees of north latitude, we passed through those enormous fields of sea-weed, (*Sargassum baccifcrum* Agardh), which have been described by almost every voyager in those seas. It existed generally in long narrow strips or bands, lying across the wind, sometimes not more than the ships length apart, at other times at a considerable distance from each other. Much diversity of opinion exists as to the origin of this floating mass; Humboldt believes it to be detached from rocks, at a considerable depth in the latitudes where it floats; while others suppose it to come

from the shores of the northern seas, having been detached from the rocks by the violence of the winds. Some again imagine that it comes from the rocky shores of the gulphs of Mexico and Florida; while many agree with me in believing that it has never had any other than its present place of abode; no one has ever seen it attached to rocks, nor have roots ever been discovered belonging to it. During the five or six days that we sailed through this gulph-weed, I hooked on board more than a thousand pieces, and every one of them presented the same appearance; the lower end of the stem had always a whitish, decayed appearance, just like a piece of tangle which has been some time cast on shore, while the extremities of the branches were universally of a very fresh and healthy appearance; such being the case, we can scarcely help believing that these remarkable plants have existed since the time of their first creation, to the present period, as we now find them, floating always in this revolving gulph stream, and undergoing a perpetual mutation from the decay at one extremity, and growth at the other; there is nothing unreasonable in this opinion, as sea-weeds are not like land plants, which derive nourishment from the spot to which they are attached. I found among the weed, a great variety of *Zoophytes* and other minute marine animals; a crab measuring from an inch to an inch and a half across, was frequent, and I observed the nest of one, formed by the small branches woven together by a strong kind of thread, not unlike that of which spiders make their webs; it contained a number of young ones.

In those latitudes, it was also curious to watch the

flight of the flying-fishes (*Exocœtus volitans*), whole shoals of which rose quite close to the ship; and I have perfectly satisfied myself, not only on this occasion, but during the several times I have crossed the ocean, that they make use of their pectoral fins as wings, during the time they remain above water. This fact I was particularly desirous to ascertain, as Cuvier, and all other authors I have consulted on the subject, except Humboldt, deny that this is the case.* The distance to which they fly is sometimes very short, at others I have watched them skimming along till the eye almost lost sight of them; I should say that they frequently extend their flight to three hundred yards; the height to which they rise above the surface of the sea, does not usually exceed three or four feet, but that they rise higher is well known, from the fact that they not unfrequently fly on board ships, which are from ten to fifteen feet out of the water. When the sea is calm, they shoot along on the same plane, like an arrow, and the impulse they acquire on leaving the water, appears to be that alone which impels them onward. The first time I discovered that they certainly use their fins as wings, was one day when a rather high swell was running; a good many fish were rising, but not in great numbers at a time. Solitary individuals could be followed by the eye to a great distance, but during their progress they did not keep on the same plane, nor did the course of their flight form the segment of a circle, but they could most distinctly be seen rising

* The following is the statement of Baron Cuvier :—"Leur vol n'est jamais bien long; s'elevant pour fuir les poissons voraces, ils retombent bientôt, parce que leurs ailes ne leur servent que de parachutes." Le Règne animal. Tom. 2. p. 287. Edit. 1829.

and falling over the heavy swell, keeping always at about the same height above the water, just as a bird would do; the Albatros, for example, when skimming along in search of food. The only time I ever saw distinctly the fins moved in the manner of wings, was in the South Atlantic Ocean; one beautifully clear day, when we were running quietly along under the influence of a light breeze, several large dolphins were playing about, one of which we saw give chase to a flying-fish; the latter rose, but its flight was followed by the dolphin. It fell close to the ship, and in attempting to rise again, the impulse was not sufficient to throw it completely out of the water; it flew along with its tail nearly out of the sea, for about a yard, when it fell a prey to its pursuer; several of the other passengers were watching it also, and by all of us the large fins were seen to be worked with great rapidity. I agree with Humboldt,* that these fishes do not always rise out of the water to escape from their enemies, as they often spring up close to ships, when there are no signs of large fishes being near. Why should the flying-fish, having the power to do so, not enjoy a flight in the air, quite as much as a duck does a dive under the water, or land animals the luxury of bathing?

Another remarkable oceanic phenomenon, is the brilliant phosphorescence of the water, which frequently occurs in low latitudes; and, presuming it will not be misplaced I shall make a few observations on the subject. On my passage from England, and while we were about 2° of south latitude, and 26° of west longitude, I was

* Personal Narrative, vol. ii. p. 15.

called up by the captain, about half-past ten o'clock at night, to witness a remarkable appearance the sea had assumed; upon reaching the deck, one of the most magnificent scenes imaginable presented itself; all round the ship, and to as great a distance as the eye could reach, the swell, which was running pretty high, was emitting from its surface, at short intervals, long broad sheets of phosphorescent light, which continued bright only for a second or two, and then disappeared. The continued glare of these long streams of light, their sudden appearance and disappearance, as if detached portions of sheet lightning were flashing from wave to wave, gave a wild and terrific aspect to the surface of the ocean; the reflection from it was so great, that the sails of the ship were illumined by the glare. On looking over the ship's stern, her wake for about fifty yards, was one continued stream of pale yellow light, upon which, ever and anon, were floating away, and becoming extinct, curious masses of a circular shape, varying from half a foot, to two feet in breadth, of a livid hue, similar to that which burning sulphur emits. These masses retained their livid flame-like appearance till they reached about six or eight yards from the ship, when they gradually became extinct; their beautiful colour contrasting singularly with the pale yellow stream on which they floated. This curious state of the sea only lasted about a quarter of an hour, the water then assuming its usual aspect, the foam at the ship's bow only presenting the sparkling appearance which it usually exhibits within the tropics. This occurred on the 7th of July; the weather had been cloudy all day, with the thermometer 79° at noon; the night

was dark, and it was blowing a fresh breeze from E.S.E., the ship going at the rate of six knots an hour.

It is well known that the circular masses of light which I have described, are produced from aggregated masses of very small marine animals, to which the name of *Pyrosoma* is given; I did not, however, capture any, as my towing net was as this time out of order, but during my voyage to Ceylon I was more fortunate; on the 25th of November, 1843, in about 3° and 4° N. lat., and 23° W. long., with cloudy weather, and the thermometer 81° at noon, shortly after it became dark, we got into a field of these animals, and though the brilliancy of their light was not not so great as on the former occasion, they were more numerous, the ship sailing though them for several hours. They were seen in broad shoals at great but irregular distances from each other. The towing net on being thrown overboard, soon procured me a large supply of the extraordinary animals of which these shoals were composed; they gave out a bright pale yellowish green light, which they retained for some time after being brought on board. Each mass was shaped not unlike the finger of a glove, being hollow, and closed at one end; they varied a little in size, but were generally about four inches in length. The little animals of which these masses are made up, are placed horizontally, and lie closely packed over each other, their head being towards the outer surface. When kept in a glass in salt water for some time, they soon separated from each other, and being very transparent were then scarcely to be distinguished from the water; they taste exactly like fresh oysters. During this voyage, I obtained four distinct

species, two of which were taken off the Cape of Good Hope; one of these finger-like masses, taken near the Equator, measured about two feet in length. I have often observed close to the ship, these bodies at a considerable depth, giving out a faint light; and I am persuaded that the brilliant flashes which were emitted from the sides of the swell, on the first occasion, were caused by the number of the *Pyrosomæ* then existing in the sea. The scintillations which issued from the foam, dashed up by the ship, were caused by a phosphorescent microscopic species of shrimp (*Noctiluca oceanica*? Spix), which I collected in great numbers, in a net made from an old flag.

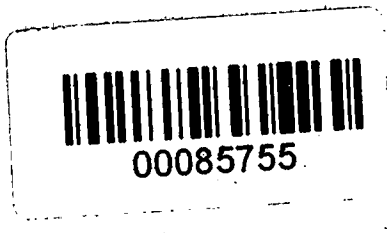
Our voyage home was a quick and a very pleasant one. We were only thirty-two days altogether at sea from Maranham, we had no rough weather, and the only calm day we experienced occurred between our losing the N.E. trades, and falling in with westerly winds. The nearer I approached home, the more my desire increased to be again among my friends; and this I believe, under similar circumstances, almost universally occurs. When we are at a great distance from, and know that we have no immediate chance of returning to those who are dear to us, we suppress as much as possible, the indulgence in hopes which cannot be realized; but when we feel that every hour is bringing us nearer home, we throw off all restraint on our imagination, and only regret, that our progress cannot be accelerated. On the evening of the eighth of July the welcome cry of "land" was heard, and on the following afternoon we made the mouth of the Mersey, but for want of sufficient water, we had to stand

off and on till next morning, during which interval we experienced a smart gale of wind from the N.N.W., which kept us all awake. Early next morning, the 10th of July, 1841, I stood once more on British ground, after an absence of upwards of five years.

Having now brought my narrative to a conclusion, it only remains to notice that the object I had in view when I left England, has been accomplished to the satisfaction of all concerned in it, and the anticipations I indulged of the pleasures to be derived from such an expedition, have not been disappointed; if almost every day brought its little annoyances, they were more than compensated by the delight which new scenes, and objects for study constantly produced. Difficulties only appear insurmountable, when they are not looked boldly in the face; and it is fortunate for us, that the bright side of the picture of the past, presents itself more frequently than the dark. I have much to congratulate myself upon; for although often exposed both by night and by day, my health, save only on one occasion, continued good; and with very few exceptions, I received the greatest kindness from all my fellow men with whom I came in contact. I have also been more fortunate than many natural history travellers, for the numerous collections shipped to England, from time to time, all arrived safely; the letters, too, which I despatched, reached their destination, with only one exception; and not one of those from home was lost, although often long in coming to my hands. It was not without many regrets that I left

Brazil, for the life I led was free and independent; the climate agreed better with my health than that of England; and the country is beautiful, and richer than any other in the world in those objects, to the study of which I have devoted my life.

THE END.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